THE IMPACT OF STATE SHAME ON THEORY OF MIND IN INDIVIDUALS WITH BORDERLINE PERSONALITY DISORDER

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ABSTRACT

Borderline personality disorder (BPD) is characterized by a marked difficulty in regulating one's emotions, as manifested by problems in a variety of areas (APA, 2013). One such difficulty is in the area of interpersonal relationships; individuals with BPD have tumultuous relationships and trouble with social cognition, which means that they exhibit difficulty processing and applying information about other people and social situations (Roepke et al., 2013). One facet of social cognition is theory of mind, which is a multi-faceted construct that refers to the ability to attribute mental states to oneself and others, and to understand that people can have different beliefs, wants, and desires from one's own (e.g., Wellman et al., 2001). Although the clinical consensus is that individuals with BPD exhibit difficulties with theory of mind, research findings are mixed. Therefore, it is important to explore variables that may impact theory of mind in individuals with BPD. One such construct is shame, which is typically experienced as a negative emotion that includes feelings or thoughts of being judged as inferior to others and the fear of being rejected by others (e.g., Leeming & Boyle, 2013). Broadly, shame is often associated with action urges to focus on oneself in relation to others, hide, withdraw from others, self-blame, and more (Rizvi & Linehan, 2005). Research demonstrates that shame-proneness is higher in individuals with BPD and is associated with a number of the disorder's hallmark symptoms, such as self-injury and suicidality (Rüsch et al., 2007). Furthermore, there is evidence that the type of shame characteristic of individuals with BPD is more maladaptive and enduring than the type of shame that is experienced by individuals with a number of other

disorders (Scheel et al., 2014). At present, research has not yet examined whether experiences of shame influence the social cognitive abilities of individuals with BPD. This was addressed in the present study, which aimed to experimentally assess the effects of state shame on theory of mind in individuals with BPD. The sample of 142 participants was recruited from three sources: a national online screening database of individuals who are willing to participate in research that has a focus on psychological history; Craigslist; and from a previous study on facial emotion recognition in individuals with BPD. Initial recruitment was based on participants' scores on online screening measures; potentially eligible participants were contacted to determine whether they were interested in participating in the study. Participants' eligibility was determined by a diagnostic interview conducted via Skype, Google Hangouts, or by phone to determine BPD diagnosis and diagnostic group assignment (BPD versus non-BPD control). Eligible participants then completed a series of measures of mood, personality, and behavior. Next, participants were randomized into one of three mood induction conditions: shame mood, sad mood, or boredom. Following the mood induction, participants completed the Reading the Mind in the Eyes Task (RMET; Baron-Cohen et al., 2001) to assess affective theory of mind and the Short Story Task (SST; Dodell-Feder et al., 2013) to assess affective and cognitive theory of mind. The results did not support the prediction that individuals with BPD who underwent the shame mood induction would exhibit greater theory of mind deficits as compared to individuals without BPD. However, exploratory analyses demonstrated that state shame predicted lower theory of mind scores across all participants when controlling for trait shame, and that trait shame slightly buffered the impact of state shame in BPD participants only. These findings provide tentative support that shame impacts theory of mind abilities in individuals with BPD.

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CHAPTER 1

INTRODUCTION

Background

Individuals with borderline personality disorder (BPD) struggle with emotion dysregulation that manifests in a variety of contexts, including interpersonal difficulties, impulsivity, suicidality, identity disturbance, and more (Diagnostic and Statistical Manual of Mental Disorders; 5th ed. [DSM-5]; American Psychiatric Association [APA], 2013). Specifically, the emotion dysregulation that is characteristic of individuals with BPD is defined as: high sensitivity and reactivity to emotional stimuli, a delayed return to emotional baseline, and difficulty modulating one's emotions (Linehan, 1993). Linehan's biosocial theory (1993) explains the disorder as the result of the transaction over time between a child's emotionally sensitive and reactive biology and an environment that invalidates his or her emotions as the child grows and develops. This transaction prevents the child from developing and learning the skills necessary to effectively regulate his or her emotions, leading to an increase over time in what is typically an already higher-than-average emotional reactivity (e.g., Rizvi, Brown, Bohus, & Linehan, 2011). Emotional reactivity is a term used to describe reactions to changes in one's environment that manifest in one or more systems of emotional responding (e.g., Gratz, Rosenthal, Tull, Lejuez, & Gunderson, 2010). Emotional reactivity can refer to an overall increased intensity of responses to emotions in general; however, studies suggest that it tends to be specific to negative emotions in BPD (Gratz et al., 2010).

Unstable interpersonal relationships are a primary feature of BPD. Although a number of personality disorders are associated with interpersonal dysfunction, individuals with BPD are significantly more likely than those with other personality disorders to exhibit a variety of

interpersonal difficulties (Zanarini, Gunderson, Frankenburg, & Chauncey, 1990). Individuals with the disorder often have tumultuous relationships, due in part to their tendency to shift rapidly between idealizing and devaluing others (APA, 2013). Although interpersonal dysfunction is just one of several aspects of the disorder, a number of other BPD symptoms frequently occur in interpersonal contexts (e.g., Lazarus, Cheavens, Festa, & Rosenthal, 2014; Roepke, Vater, Preibler, Heekeren, & Dziobek, 2013). Furthermore, research supports the existence of an interpersonal hypersensitivity phenotype underlying BPD that is characterized by a fearful, reactive, and sensitive relational style (Gunderson & Lyons-Ruth, 2008; Gunderson, 2007). Thus, although BPD is typically defined as a disorder of emotion regulation (e.g., Selby & Joiner, 2009), interpersonal difficulties are also at the core of the disorder and contribute significantly to the stigma associated with BPD (e.g., Hill et al., 2008).

Social Cognition

One important area of interpersonal functioning is social cognition. This skill set refers to the cognitive functions that allow individuals to process, store, retrieve, and apply social information, thereby enabling them to interact with and understand each other (e.g., Adolphs, 1999; Frith & Frith, 2007). Incorporating aspects of both emotion recognition and social functioning, it consists of the following domains: emotion processing, social perception, attributional biases, and theory of mind (Pinkham, 2014). Broadly, difficulties with social cognition are associated with various forms of psychopathology. Impairment in social cognition is a defining feature of autism (APA, 2013), with prominent symptoms including difficulties with verbal and nonverbal communication, understanding nonliteral information, and identifying connections between behaviors and social contexts (Baron-Cohen et al., 1983; Flavell, 1999). Social cognition deficits are central to schizophrenia symptoms and predict functioning in

individuals with the disorder (Savla, Vella, Armstrong, Penn, & Twamley, 2013). Although not necessarily part of diagnostic criteria, dysfunctions in these abilities are associated with a number of mood disorders as well (e.g., Epa & Dudek, 2015). For example, research demonstrates that individuals with bipolar disorder suffer impairments across multiple social cognitive domains (Purcell, Phillips, & Gruber, 2013).

Social Cognition and BPD

Individuals with BPD exhibit difficulty processing and applying information about other people and social situations. For instance, evidence suggests that BPD is associated with ineffective interpersonal problem-solving approaches, including more passive strategies (e.g., Kremers, Spinhoven, Van der Does, & Van Dyck, 2006) as well as solutions that are less applicable to the problem (Maurex et al., 2010). Several underlying mechanisms contribute to the social cognitive impairments in this population. One is the way in which individuals with BPD produce social signals (Roepke et al., 2013). For example, there is evidence that it is more difficult to ascertain the meaning of facial emotion expressions emitted by individuals with BPD as compared to those without BPD. Flury, Ickes, and Schweinle's (2008) study of empathic accuracy in dyads found that individuals with BPD performed better than did individuals without BPD. Initially, this would appear to indicate that individuals with BPD were better able to accurately recognize their partners' emotions. However, further analysis revealed that the superior performance exhibited by individuals with BPD was because their facial emotional expressions were more challenging for others to read, not because they were better at perceiving others. Due to the transactional nature between individuals' social signals in interpersonal interactions, ambiguous facial expressions can influence the way in which others interact with

individuals with BPD, which can subsequently affect their emotional responses and outward reactions to others.

Research suggests that individuals with BPD also have deficits in accurately receiving social signals (Roepke et al., 2013). One reason for this is that individuals with BPD often have negative interpretation biases. This aligns with the cognitive theory for personality disorders, which states that individuals with personality disorders possess negative schema about the world (Beck et al., 2001). Pretzer (1990) argued that the schemas of individuals with BPD typically center around the following three beliefs: the world and others are dangerous; the individual is powerless; and the individual is inherently bad and wrong. Research using the Personality Disorder Belief Questionnaire (PDBQ; Dreessen & Arntz, 1995) has provided evidence for the existence of these underlying schema in BPD (e.g., Arntz, Dreessen, Schouten, & Weertman, 2004). It is important to note that personality disorders are not the only disorders characterized by a negative outlook about the world. Major depressive disorder is a key example, as hallmark symptoms of the disorder as well as theoretical models explaining its development center around negative beliefs and schemas (APA, 2013; Beck, 1967). However, research suggests that certain types of negative schema are stronger in individuals with BPD than they are in individuals with depression. Barnow and colleagues (2009) compared the interpersonal evaluations made by individuals with BPD, depressed individuals, and healthy controls by having participants view and evaluate brief clips of film characters. They found that both depressed individuals as well as individuals with BPD had less positive and more negative evaluations than did healthy controls. However, individuals with BPD had greater negative evaluative biases for aggressive traits than did individuals with depression. This suggests that individuals with BPD might be particularly

vulnerable to certain types of negative lenses with which they view their world, which can influence their perceptions and interpersonal interactions in a variety of ways.

Theory of Mind

One of the domains within social cognition that is particularly relevant to BPD is theory of mind (ToM). Broadly, this refers to the ability to attribute mental states to others and to oneself (Premack & Woodruff, 1978). As a construct, "mental states" refers to wants, wishes, desires, intentions, and all other internal states that manifest in and influence human behavior. In addition to the recognition of mental states, ToM includes the capacity to identify ways in which individuals' behaviors are in accordance with their mental states, resulting in a coherent nature of human behavior (Wellman, Cross, & Watson, 2001). ToM can be divided into two categories: cognitive ToM and affective ToM (e.g., Shamay-Tsoory & Aharon-Peretz, 2007). Cognitive ToM refers to the ability to infer the beliefs, wants, wishes, and desires of others, whereas affective ToM refers to the ability to infer what other people are feeling (Shamay-Tsoory, Aharon-Peretz, & Levkovitz, 2010). Empathy, which is the capacity to share and understand others' emotional experiences (e.g., Davis, 1983), incorporates aspects of both cognitive ToM and affective ToM.

Children typically begin to develop ToM within their first few years of life. Research has shown that children as young as three begin to attribute others' actions to their beliefs and mental states, as opposed to their own (e.g., Bartsch & Wellman, 1989). Different ToM abilities develop at different times, with "simple" abilities appearing earlier (e.g., Apperly, Warren, Andrews, Grant, & Todd, 2011). One such "simple" ability is belief-desire reasoning, which refers to the capacity to be able to identify and comprehend other people's beliefs as well as the ways in which other people's beliefs influence their behavior (e.g., Apperly et al., 2011). Another is

false-belief reasoning, which refers to one's ability to be able to understand that someone else can believe something that the individual himself/herself knows is false (e.g., Wellman et al., 2001). Measures of false-belief reasoning in children often use a paradigm based on the displacement task (e.g., Baron-Cohen, Leslie, & Frith, 1985; Wimmer & Perner, 1983). Displacement tasks typically depict a story character put an object in a particular place and subsequently the room, after which a different character displaces the item without the original story character's knowledge. The original story character returns to the room, and children are then asked where the original story character will go to look for the object. Children who possess false-belief reasoning will be able to identify that the original story character will believe the object is where it was initially placed; children without false-belief reasoning will respond that the story character will go to look in the new location to where the object was displaced. These "simple" ToM skills serve as the foundation for the subsequent development in later childhood of more advanced ToM abilities, such as the recognition and comprehension of faux pas, metaphors, irony, and deception (e.g., O'Hare, Bremmer, Nash, Happe, & Pettigrew, 2009; Wellman & Hickling, 1994).

As ToM manifests during childhood, much of the original research on this construct was done with children in a developmental context. This has a number of implications for research on ToM in adults. First, many of the original measures used are similar to measures used with children; consequently, the ecological validity of such measures with adults is questionable (e.g., Peterson, Brakoulias, & Langdon, 2016). A number of ToM measures have also been created specifically to differentiate between healthy individuals and individuals with autism or schizophrenia, two disorders whose defining features include ToM impairment (e.g., Sharp, 2006). Thus, a related issue is that many measures of ToM in adults have ceiling effects for

individuals without severe ToM impairment (e.g., Dodell-Feder, Lincoln, Coulson, & Hooker, 2013; Sharp, 2006). Taken together, these factors highlight the importance of utilizing measures that represent situations that are relatable to adult experiences and that incorporate different mental states and ToM abilities when assessing ToM functioning in adults.

Mentalization

Mentalization is the process by which individuals are able to represent and understand the thoughts, feelings, wishes, beliefs, and desires in themselves and in others (e.g., Bateman & Fonagy, 2004a). This includes being able to recognize mental states as well as identify and comprehend ways in which mental states influence behavior. It is theorized that the capacity to mentalize develops as the result of the recognition and validation of children's internal states by key adult attachment figures. Specifically, the adult's mirroring of a child's internal state in a marked (exaggerated) and time-contingent way enables the child to learn to identify his/her own internal experience as his/her own, and to later be able to recognize the internal states of others (Fonagy & Bateman, 2008). Mentalization and ToM exhibit a significant degree of overlap; both include the capacity to imagine and understand another person's experience and behavior as well as the ability to assume another's perspective in order to better comprehend that individual's experience (Górska & Marscał, 2014). However, there are several key differences between these domains. One is that mentalization involves one's understanding of others and oneself, whereas ToM is centered solely around the former (e.g., Arntz, Bernstein, Oorschot, & Schobre, 2009). Additionally, mentalization involves a level of emotional involvement and arousal that is not necessary to ToM. Specifically, mentalization results in the activation of an individual's attachment system, thereby resulting in a heightened level of emotional arousal and relational

involvement and requiring processing of one's subsequent emotional experience (Fonagy & Target, 1997; Beaulieu-Pelletier, Bouchard, & Philippe, 2013; Górska & Marscał, 2014).

Bateman and Fonagy created mentalization-based therapy (MBT) to be used as a treatment modality for adults with BPD (Bateman & Fonagy, 2004b). They theorized that BPD is the result of early psychological trauma, most often a disrupted attachment that prevents the child from developing effective self-other representations in their early relationships (Fonagy & Bateman, 2008). Similar to Linehan's (1993) biosocial theory, MBT argues that the effects of the environment's response to the child's emotional experiences prevent them from developing the ability to identify and label emotions in themselves and others. Consequently, it is theorized that individuals with BPD exhibit difficulties in identifying the differences between their internal experience and external reality (Bateman & Fonagy, 2004b). Specifically, MBT is based on the premise that it is especially challenging for individuals to effectively mentalize during high states of emotional arousal (Fonagy & Bateman, 2008). For example, when experiencing a high-intensity negative emotion in an interaction with someone with whom they are closely attached, individuals with BPD often have trouble accurately identifying the mental state that the other person is experiencing (e.g., Fonagy & Luyten, 2009).

Theory of Mind and BPD

The existence and practice of MBT is based on the belief that individuals with BPD exhibit impairments in ToM. Rather than develop the ability to accurately reflect and determine what others and themselves are thinking and feeling, MBT is based on the theory that individuals with BPD draw upon the dysfunctional relational patterns they learned growing up and apply these to their present conceptualizations of what others are experiencing (e.g., Ghiassi, Dimaggio, & Brüne, 2010). In addition to causing relationship difficulties, impairments in ToM

are likely to lead to additional interpersonal challenges and ineffective emotional responses to others (e.g., Preisler, Dziobek, Ritter, Heekeren, & Roepke, 2010). MBT argues that difficulties with mentalizing constitute a central and pervasive factor in the development and symptoms of BPD (e.g., Bateman & Fonagy, 2003).

A number of studies suggest that ToM is impaired in individuals with BPD. Sharp and colleagues' (2011) study of the relationship between ToM and BPD features among adolescents found that ToM impairments explained 15% of BPD symptoms. Domes and colleagues (2008) utilized morphing facial expressions to assess facial emotion recognition, one aspect of affective ToM, in individuals with BPD. They found that individuals with BPD were more likely to perceive anger when the stimuli were ambiguous, thereby suggesting that individuals with BPD have a negative bias in interpreting affective information from others. Shamay-Tsoorey, Ravid, and Levkovitz (2010) found that individuals with BPD exhibited deficits in cognitive ToM, as measured by the "Faux Pas Test" (Stone, Baron-Cohen, & Knight, 1998; Gregory et al., 2002). There is also evidence that suggests that individuals with BPD engage in "hypermentalizing," in which ToM impairments are the result of over-attribution of mental states to others (Bateman & Fonagy, 2004a; Sharp et al., 2013; Sharp & Vanwoerden, 2015). Findings from functional neuroimaging research provides further support in demonstrating that connections between brain regions associated with ToM function differently in individuals with BPD. O'Neill and colleagues (2015) found reduced connectivity between the anterior cingulate cortex and several of the brain regions involved with ToM processing in individuals with BPD. Similarly, Mier and colleagues (2013) found that individuals with BPD experienced hypoactivation in the mirror neuron system as ToM task complexity increased, whereas individuals without BPD experienced increased activation in the same areas.

In contrast, other research does not support the hypothesis that individuals with BPD exhibit ToM impairments. Ghiassi and colleagues (2010) found that individuals with BPD performed as well as individuals without BPD on a ToM cartoon task assessing cognitive ToM. Arntz and colleagues (2009) found no impairments in individuals with BPD relative to individuals with other personality disorders as well as nonpatients on Happé's (1994) "advanced test of theory of mind," which assesses the ability to interpret nuances around interpersonal situations. There is also evidence in support of the theory that individuals with BPD exhibit keener emotional sensitivity towards others, otherwise referred to as "borderline empathy" (Krohn, 1974). Early studies on nonverbal sensitivity and emotion prediction in others (Frank & Hoffman, 1986; Ladisich & Feil, 1988) supported the "clinical paradox" (Krohn, 1974) experienced by many clinicians (e.g., Arntz et al., 2009), in which individuals with BPD are simultaneously more perceptive of others' emotions as well as more likely to have interpersonal difficulties with them. Lynch and colleagues (2006) study of facial emotion recognition, which is one component of affective ToM, found that individuals with BPD were able to correctly perceive emotions at lower intensities of emotional expression relative to controls, thereby suggesting a heightened sensitivity to facial emotion recognition. Fertuck and colleagues (2009) found that individuals with BPD exhibited stronger affective mentalizing skills than did individuals without BPD, as measured by the "Reading the Mind in the Eyes" Test (RMET; Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001). Schilling and colleagues (2012) found no differences in accuracy between BPD and healthy controls using the same task, although they did find that individuals with BPD exhibited greater confidence in their abilities. Franzen and colleagues (2011) found that individuals with BPD were more likely to effectively incorporate emotional cues from others in their interpretations of and responses to behaviors of game

partners in a virtual reality trust game. Therefore, although there is considerable evidence of ToM deficits in BPD, there is also research supporting the opposite.

Several theories purport to explain these mixed findings. One is that certain ToM abilities are impaired in BPD, whereas others are unaffected. This is also referred to as the selective impairment hypothesis (e.g., Semerari et al., 2015). Broadly, research supports the notion that ToM includes skills that develop at different rates, and that these skills can be differentially affected by different personality disorders (Semerari et al., 2007). Furthermore, research suggests that individuals with BPD primarily exhibit impairments in ToM abilities that require complex, higher-level cognitive processes. This might be due in part to difficulties with executive functioning. Executive functioning deficits appear to predict ToM deficits in individuals with BPD (Baez et al., 2015). Similarly, Minzenberg, Poole, and Vinogradav (2006) found that individuals with BPD performed similarly to individuals without BPD on tasks involving either facial stimuli or prosodic stimuli, but that they performed more poorly when the integration of both types of information was required. Preisler and colleagues (2010) found that individuals with BPD exhibited no impairment in the RMET, a simpler task, but did experience deficits in a more complex ToM task. Further exploration of variables that may impact theory of mind abilities and performance in individuals with BPD is needed. Given the transactional relationship between emotion dysfunction and interpersonal relationships that is characteristic of this disorder, it is possible that specific types of emotional experiences undermine ToM abilities in individuals with BPD.

Self-Conscious Emotions

"Self-conscious emotions," such as shame, guilt, and pride, are emotions that vary across cultures in terms of facial recognition and physiological experience, and that serve primarily

social functions (Tracy & Robins, 2004). These stand in contrast to the "basic emotions," which include such emotions as anger, fear, sadness, disgust, happiness, and surprise, and which are biologically based and universal across cultures. The experience of self-conscious emotions involves self-processes, including self-awareness and self-evaluation (Tracy & Robins, 2004). This is reflected in the cognitive appraisals associated with these emotions, which suggests that the regulation of these emotions might differ in comparison to the regulation of basic emotions as well (Tracy & Robins, 2004). One such regulation strategy that might have differential effects on self-conscious emotions, in comparison with basic emotions, is self-distancing, or looking at a personal situation from an outside perspective. Katzir and Eyal (2013) experimentally evaluated the effects of self-distancing and self-immersion on anger versus guilt and sadness versus shame by experimentally manipulating participants' emotions and regulatory strategies. They found that self-distancing decreased anger and sadness, but not guilt or shame. Therefore, the regulation of self-conscious emotions, such as shame and guilt, differs from the ways in which we regulate basic emotions.

Shame

Although a variety of emotions can be challenging for individuals with BPD to regulate, one emotion that plays a particularly significant role is shame. Shame is broadly conceptualized as a negative emotion that includes feelings or thoughts of being judged as inferior to others (e.g., Leeming & Boyle, 2013). It is important to differentiate between the constructs of state shame and shame-proneness; the former is specific to a given situation and is temporary, whereas the latter refer to a person's general propensity to experience shame across different circumstances and contexts (Rüsch et al., 2007). Shame is experienced as a global assessment of the self (Dorahy, 2010) that prompts urges to hide, conceal oneself, and withdraw from others,

and that also leads to rumination about self-blame (Rizvi & Linehan, 2005). Shame is thus typically associated with a variety of negative experiences and interpersonal consequences. It is also predictive of increases in proinflammatory cytokine activity and cortisol. Dickerson, Kemeny, Aziz, Kim, and Fahey (2004) assessed the relationship of shame to proinflammatory cytokine activity by conducting a study in which participants wrote about upsetting experiences for which they still blamed themselves, and found a positive relationship between increases in shame and increases in proinflammatory cytokine activity. This research suggests that shame has unique detrimental effects on the immune system, which also implies that chronic, repeated experiences of shame might have long-lasting immunological consequences (Dickerson et al., 2004).

Although shame is often conceptualized as a unilateral construct that is inherently harmful and destructive, it is a multifaceted emotion with different dimensions. Scheel and colleagues (2014) theorize that there are several different shame dimensions that can be adaptive or maladaptive, depending on circumstances and severity; furthermore, too much as well as too little of certain types of shame in different contexts can be pathological. To evaluate this, they created the Shame Assessment for Multifarious Expressions of Shame (SHAME) to assess bodily shame, cognitive shame, and existential shame. Bodily shame refers to shame experienced around the body ideal, intimacy, and sexuality; cognitive shame refers to shame experienced around social exclusion and the violation of one's morals or standards for competency; and existential shame refers to a long-lasting form of shame about the self as a whole, which is not necessarily prompted by a specific event. They proposed that existential shame is a typically maladaptive dimension, whereas bodily and particularly cognitive shame can be adaptive in particular scenarios and contexts, and maladaptive in others. For example, if someone were to

experience shame during a job interview due to exhibiting poor hygiene (bodily shame) and sharing overly private information with interviewers (cognitive shame), the emotion would be adaptive; it would provide the individual with helpful information about the likely negative social consequences of his/her behavior (e.g., judgment from interviewers, lower chance of getting the job, etc.). However, if someone were to experience shame due to possessing an unrealistically thin body ideal (bodily shame) or unrealistically high performance standards (cognitive shame), the emotion experienced would be maladaptive; it would provide the individual with incorrect and harmful information that does not accurately reflect his/her social reality.

Shame versus Guilt

Shame is often associated with guilt, largely because there is considerable overlap between these two emotions. The constructs of guilt and shame were almost indistinguishable in psychological research until relatively recently due to a lack of clear operationalization around their differences. There is considerable similarity between guilt and shame that creates this overlap. Both of these self-conscious emotions are also considered to be "moral emotions;" they help us identify and adhere to our morals and values in that we experience them when we act or think in ways that go against our morals or values (Sheikh & Janoff-Bulman, 2010). Shame and guilt are both typically experienced as negative and uncomfortable emotions (Stuewig, Tangney, Heigel, Harty, & McCloskey, 2010). Furthermore, many of the situations that prompt one of these emotions can also prompt the other, and many individuals will report experiencing both emotions when recounting past experiences (Niedenthal, Tangney, & Gavanski, 1994). Additionally, some of the action urges prompted by shame can also be prompted by guilt, and

vice versa. Thus, it is unsurprising that these two emotions are often used as substitutes for one another (Sheikh & Janoff-Bulman, 2010).

In spite of these similarities, shame and guilt are distinct from each other in a number of ways. Lewis (1971) was one of the first to distinguish between the two emotions, describing shame as a reflection of negative beliefs about one's global self, identity, or essence, and guilt as a reflection of negative beliefs about a specific behavior that has gone against one's morals or values. In other words, guilt is a response to an offense we believe we have made for which we feel a sense of responsibility (Mann, 2010). This is an important distinction, as the way in which we evaluate ourselves when we experience shame is much different from the way in which we view ourselves when we experience guilt. While we judge ourselves as having committed a "bad act" when we experience guilt, we judge ourselves as being a bad person when we experience shame (Sheikh & Janoff-Bulman, 2010). Thus, the cognitive appraisals associated with the emotions differ greatly, which is likely to influence the way in which regulation occurs because of the significant role that appraisals play in the emotion regulation process.

According to the process model of self-conscious emotions proposed by Tracy and Robins (2004), both shame and guilt are prompted by appraisals pertaining to discrepancies between an event and the identity that a person wishes to uphold. However, while guilt pertains to unstable attributions about one's self, shame pertains to stable self-attributions. Tracy and Robins (2006) conducted several studies to assess the differences between shame and guilt appraisals in their theoretical process model. Of note is their finding that individuals higher in guilt-proneness were more likely to make internal attributions, and thus less likely to place blame on external causes, than were individuals higher in shame-proneness. As noted by Tracy and Robins (2006), this suggests that the cognitions experienced by individuals with high guilt-

proneness are likely to reinforce their guilt; therefore, behavioral emotion regulation strategies are more effective than cognitive regulation strategies are in reducing maladaptive guilt in these individuals. Because guilt is often experienced in response to a specific behavior that is not necessarily a reflection of a stable self-attribution, many of the action urges associated with guilt pertain to ways to correct for this behavior. For example, guilt typically motivates individuals to account for their behaviors to others, try to fix situations if possible, and change their future behavior so that it aligns with their morals (Sheikh & Janoff-Bulman, 2010). This contrasts significantly with the action urges associated with shame, an emotion that typically reflects stable self-attributions. Specifically, shame encourages individuals to flee a shame-provoking situation, deny the occurrence of specific behaviors, and pull away from others. When someone experiences intense shame, there is typically nothing that can be done to fix someone's "bad self"; however, along with guilt comes ways to correct one's "bad behavior" (Sheikh & Janoff-Bulman, 2010). Therefore, shame tends to motivate people to pull away from others and keep part or all of themselves in secrecy, whereas guilt can draw people towards others so that they can remedy the action that they have done, and possibly even repair and strengthen relationships. This suggests that guilt can lead to behaviors that are beneficial to interpersonal relationships, whereas shame is likely to lead to ineffective cognitions that harm relationships.

Shame and BPD

Although shame is not included in the diagnostic criteria for BPD, research and clinical experience strongly suggest that it might be an underlying facet of the disorder, both in terms of the degree to which shame-proneness is present in these individuals as well as the relationship that shame has with the symptomatology associated with the disorder. To assess the presence of shame in BPD, Rüsch and colleagues (2007) assessed levels of explicit and implicit shame in

women with BPD, as compared to women with social phobia and healthy controls. They used self-report measures to assess explicit shame, including both trait and state shame, as well as the Implicit Association Test (IAT), which compared shame-prone self-concept and anxiety, to assess implicit shame. Rüsch and colleagues found that women with BPD had higher levels of explicit and implicit shame than did individuals with social phobia and healthy controls, which is particularly notable because of the strong association between social phobia and shame.

In addition to higher shame-proneness, research suggests that individuals with BPD are more reactive to experiences of shame than are individuals with other personality disorders. Gratz and colleagues (2010) experimentally assessed emotional reactivity and recovery in individuals with BPD as compared to individuals with other personality disorders. They found that individuals with BPD exhibited a higher and longer-lasting experience of shame, but not other emotions (irritability, anger, and hostility). Taken together, these findings suggest that BPD is associated with higher proneness and reactivity to shame.

Research also supports a relationship between shame and both suicidality and self-harm, the latter of which constitutes a key feature of BPD (APA, 2013). Brown, Linehan, Comtois, Murray, & Chapman (2009) assessed the role of shame as a prospective predictor of self-inflicted injury in individuals with BPD and found that shame was associated with higher levels of self-injury. Wiklander and colleagues (2012) assessed shame-proneness in patients who had attempted suicide as compared to nonsuicidal psychiatric patients and healthy controls. They also compared suicide attempters with BPD to suicide attempters without BPD. Contrary to Wiklander and colleagues' (2012) hypothesis, they did not find that shame-proneness was generally highest among all patients who attempted suicide; rather, they found that BPD psychopathology played a role. Specifically, female suicide attempters with BPD were highest in

overall shame-proneness and shame-proneness was lower among attempted suicide patients without BPD than it was among suicide patients with BPD. These findings suggest that the relationship between shame and suicidality may be specific to BPD; in other words, it is possible that associations between shame and suicidality are reflective of the relationship between BPD and shame (Wiklander et al., 2012).

Research also suggests that the nature of shame in BPD is different from that of shame in other disorders, even those that are strongly associated with shame. Scheel and colleagues (2014) evaluated the relationship of different types of shame (bodily, cognitive, and existential) to BPD, major depressive disorder (MDD), and social anxiety disorder (SAD). They administered the SHAME self-report questionnaire to individuals with each of these disorders, as well as to a community sample. In line with their predictions, individuals with BPD had higher levels of existential shame as compared to all of the other groups assessed. As existential shame is chronic, enduring, and all-encompassing of one's identity, it is the most maladaptive form of the three types. Although both bodily shame and cognitive shame can be harmful as well, there are more opportunities for these types of shame to fit a situation and serve potentially adaptive functions. For example, extremely poor hygiene habits are likely to result in social judgment; bodily shame might motivate one to be more mindful of hygiene practices in order to be socially accepted. The disclosure of a greater level of personal information that is appropriate for a given relationship is likely to lead to rejection from others; cognitive shame might prompt someone to change the style of his/her interactions with that person. However, unlike bodily and cognitive shame, existential shame is much less likely to occur as a response to a single event and is more likely to reflect an underlying proneness to a lasting, shameful mood that surrounds fundamental beliefs about one's inherent worthlessness (Scheel et al., 2014). Therefore, this implies that not

only are individuals with BPD higher in shame-proneness than are individuals with other disorders, but the shame they experience is also likely to be more maladaptive and enduring, and is less likely to motivate behavior that decreases the likelihood of social judgment and rejection.

BPD and Rejection Sensitivity

The shame response in BPD may be context-specific. Social rejection and negative evaluation are two situations that typically prompt shame in individuals, and are particularly relevant contexts to the study of BPD (Chapman, Walters, & Dixon Gordon, 2012). There is evidence that negative evaluation within the social context has a bigger impact on individuals with BPD than negative evaluation in other contexts, such as academic contexts (Chapman et al., 2012). A strong relationship between rejection sensitivity and BPD symptoms has been found in both clinical and nonclinical populations (Staebler, Helbing, Rosenbach, & Renneberg, 2011). Several studies have used the Cyberball (Williams & Jarvis, 2006) paradigm, a virtual ball toss game, to evaluate the responses of individuals with BPD to either social inclusion or social exclusion. Staebler and colleagues (2011) found that individuals with BPD exhibited higher other-focused negative emotions (anger, resentment, and contempt) after being excluded, and Renneberg and colleagues (2012) found that individuals with BPD reported higher levels of perceived exclusion across both study conditions. Taken together, these studies demonstrate that BPD is associated with greater sensitivity and emotional reaction to social rejection.

Theory of Mind, Shame, and BPD

It is theorized that the interpersonal challenges that individuals with BPD experience are often a consequence or manifestation of their difficulties with emotion regulation (e.g., Linehan, 1993). Evidence suggests that emotion dysregulation accounts for the relationship between BPD symptoms and interpersonal difficulties (Herr, Rosenthal, Geiger, & Erikson, 2013). For

example, Scott, Stepp, and Pilkonis (2014) demonstrated that difficulties with emotion regulation helped explain the relationship between BPD symptoms and aggression, a specific type of interpersonal dysfunction that is characteristic of BPD. Therefore, one way to increase our understanding of the interpersonal difficulties associated with BPD is to examine how specific types of interpersonal challenges are impacted by emotional experiences. One type of interpersonal process that is likely to be affected by an emotional state is ToM. This is substantiated by MBT theory, which asserts that for individuals with BPD, the ability to understand others' mental states is especially challenging under conditions of high emotionality (e.g., Bateman & Fonagy, 2003). However, there is a dearth in the literature around whether state emotions influence ToM performance in individuals with BPD. Although several studies have substantiated the importance of context with respect to ToM functioning in BPD (e.g., Domes et al., 2008; Franzen et al., 2011), information on the specific emotional experiences that these contexts evoked was not examined. Deckers and colleagues (2015) did find a relationship between stress-induced negative mood and ToM impairment. While this suggests that negative emotions can have an effect, this did not address the relationship between specific emotions and ToM performance. Therefore, research is needed on the impact of specific types of emotional experiencing on ToM performance in individuals with BPD.

Shame is particularly relevant to ToM because of the ways in which it affects interpersonal functioning. Many of the action urges prompted by shame, including a focus on oneself in relation to others and the desire to pull away from others (Sheikh & Janoff-Bulman, 2010), are interpersonally driven and associated with powerful, self-directed interpersonal cognitions. Thus, the experience of shame has the potential to hinder one's ability to focus on and be able to understand others' experience. Individuals with BPD have higher shame-

proneness (Rüsch et al., 2007) and exhibit greater difficulty regulating shame (e.g., Gratz et al., 2010). Therefore, if shame does have an effect on ToM, this impact is likely to be more strongly experienced by individuals with BPD due to the nature of their shame experience.

Present Study

The present study aimed to increase our understanding of variables that affect ToM functioning in individuals with BPD by assessing the impact of state shame on ToM in this population. Although difficulties with ToM are theorized to underlie the disorder's development (e.g., Bateman & Fonagy, 2003), mixed findings regarding ToM abilities in individuals with BPD highlight a need for further identification and exploration of additional factors impacting ToM in BPD. The interpersonal effects of the shame experience, in conjunction with the role that this emotion plays in BPD, suggest that ToM performance in individuals with BPD might be differentially impacted by experiences of this emotion.

This study experimentally assessed the relationship between state shame and ToM abilities by assessing the effects of a mood induction on subsequent ToM performance in individuals with BPD as compared to individuals without BPD. After completing a series of baseline questionnaires, participants were randomized into one of three 5-minute mood induction conditions: shame mood induction, sad mood induction, or a boredom mood induction. The sadness and boredom mood inductions were both designed to be control conditions. Specifically, assessing the effects of sadness on ToM as compared to shame were used to ensure that the impact of the shame induction was specific to the effects of shame, and not a reflection of the effects of another type of negative affect on ToM. Furthermore, BPD is associated with lower "emotion granularity" (Barrett, 2004) and clarity, meaning that individuals with BPD are less able to distinguish among emotion states and more likely to use global, nonspecific terms (e.g.,

"good" or "bad") when describing their emotional experience (e.g., Suvak et al., 2011). Therefore, an "emotion control" condition was needed to ensure that shame has a differential impact on ToM in comparison to other negative emotions. Sadness was chosen as a control emotion due to the high comorbidity between BPD and major depressive disorder (e.g., Zimmerman & Mattia, 1999). The boredom induction served as a non-emotion control condition.

Hypotheses

The present study evaluated several hypotheses. The first hypothesis (Hypothesis 1) was that for each ToM outcome (the RMET or the SST), the mood induction (experimental condition) would moderate the relationship between diagnostic group (BPD group versus non-BPD control group) and theory of mind. Specifically, I predicted that individuals with BPD who underwent the shame mood induction would have lower theory of mind scores than individuals with BPD who underwent the sad or bored (control) mood conditions, whereas the mood induction would not significantly affect theory of mind in non-BPD controls, whose theory of mind scores would not be significantly different from the theory of mind scores of individuals with BPD in the sad or bored (control) mood conditions.

The second hypothesis (Hypothesis 2) was that for each ToM outcome, the relationship between diagnostic group (BPD versus non-BPD control) and theory of mind would be mediated by identity disturbance and trait shame, the effects of which would be moderated by the mood induction (experimental condition). Specifically, I predicted that individuals with BPD would have higher identity disturbance and trait shame, which would in turn lead to lower theory of mind scores when participants underwent the shame mood induction.

The third hypothesis (Hypothesis 3) was that for each ToM outcome, the relationship between diagnostic group (BPD versus non-BPD control) and theory of mind would be mediated

by rejection sensitivity, the effects of which would be moderated by the mood induction (experimental condition). Specifically, I predicted that individuals with BPD would have higher rejection sensitivity, which would in turn lead to lower theory of mind scores when participants underwent the shame mood induction.

In addition to the hypotheses stated above, I conducted exploratory analyses on the relationships between BPD, trait shame, state shame, and theory of mind.

CHAPTER 2

METHOD

Participants

The present study recruited 142 participants 18 years of age and older, all English speaking, from several sources. The first was a national online screening database of individuals who are willing to participate in research that has a focus on psychological history. Advertisements were posted on Craigslist boards in major cities in every state in the country. The online screening survey included questions about demographic information, questions about past and present mental health care utilization, and screening measures for various psychological disorders. Our second recruitment source constituted participants directly recruited online via Craigslist. Advertisements were posted on Craigslist boards in major cities across the country. The ads directed potential participants to a link to a screening survey similar to that used to create the online database of participants who are willing to participate in research that has a focus on psychological history. The only modifications made to the screening survey used for the second recruitment strategy constituted the exclusion of questions that were included in the original screening survey but were not used as recruitment criteria for the present study.

From these two recruitment sources, potential participants were recruited primarily based on their scores on the McLean Screening Instrument for Borderline Personality Disorder (MSI-BPD; Zanarini et al., 2003). The clinical cutoff for the MSI-BPD is 7. Individuals for the BPD group were recruited among those who scored 7 or higher on the MSI-BPD. Individuals for the non-BPD control group were recruited among those whose score was less than or equal to 2 on the MSI-BPD.

Information from several other screening measures included in the online screening survey were used when recruiting individuals for the non-BPD control group in order to

minimize the presence of psychopathology in this group. Specifically, individuals were recruited for the non-BPD control group if, in addition to having a 2 or lower on the MSI-BPD, they also met the following criteria: a score of 14 or lower (out of 27) on the Patient Health Questionnaire (PHQ-9; Kroenke & Spitzer, 2002), a 9-item screening measure for current depression; a score of 2 or lower (out of 4) on the Primary Care PTSD Screen (PC-PTSD; Prins et al., 2004), a 4-item screening measure for post-traumatic stress disorder; a score of 9 or lower (out of 21) on the Generalized Anxiety Disorder-7 (GAD-7; Spitzer, Kroenke, Williams, & Löwe, 2006), a 7-item screening measure for generalized anxiety disorder; a score of 3 or lower (out of 10) on the Short Obsessive-Compulsive Disorder Screener (SOCS; Uher, Heyman, Mortimore, Frampton, & Goodman, 2007), a 5-item screening measure for obsessive-compulsive disorder; a score of 7 or lower (out of 20) and a score of 0 (*not at all*) or 1(*a little*) on an item asking about degree of work, home, or school life disruption due to fear of social situations or embarrassment, on the Social Phobia Screener (SOPHS; Batterham, Mackinnon, & Christensen H; 2017), a 5-item screening measure for social phobia; a score of 0 or 1 (out of 5) on the SCOFF Questionnaire (SCOFF; Luck et al., 2002), a 5-item screening measure for eating disorders; and a score of 3 or lower (out of 8) on a shortened version (8 of 24 items) of the antisocial personality disorder subscale of the Personality Assessment Inventory (PAI; Morey, 2007).

For individuals who met the above criteria and expressed interest in participating in the study, the diagnostic screening interview was used to determine study eligibility. Individuals were excluded from the study if they endorsed any symptoms of psychosis or if they met criteria for current mania or hypomania during the diagnostic interview. Individuals were also excluded from the non-BPD control group if they met criteria for current depression during the diagnostic interview. Additionally, potential participants were excluded if the group (BPD or non-BPD

control) to which they would be assigned based on their score on the MSI-BPD differed from the group to which would be assigned based on the results of their diagnostic interview. For example, if a potential participant scored an 8 on the MSI-BPD but did not meet criteria for BPD in the subsequent diagnostic interview, the potential participant was excluded from the study; similarly, if a potential participant scored a 1 on the MSI-BPD but did meet criteria for BPD during the subsequent diagnostic interview, the potential participant was excluded from the study.

The third source for participant recruitment was a previous study on facial emotion recognition in BPD. Participants in that study provided consent at the time of their participation in that study to be contacted about future studies. All of these individuals met diagnostic criteria for BPD based on this previous study's diagnostic interview, which screened for BPD using the BPD module of the Structured Clinical Interview for DSM-5 Personality Disorders (SCID-5 PD; First, Williams, Benjamin, & Spitzer, 2015). Given that they had all met criteria for BPD in the past, individuals from this previous study were recruited for the BPD group only. Therefore, these individuals were excluded from the present study if they did not meet criteria for BPD in this study's diagnostic interview; in other words, these individuals were excluded if they met criteria for the non-BPD control group. As with participants recruited from the other two sources, individuals were also excluded from the study if they endorsed any symptoms of psychosis or if they met criteria for current mania or hypomania during the diagnostic interview.

In addition to the exclusionary criteria above, participants were also excluded after the diagnostic interview if they scored less than a 3 out of 6 on the Comprehension subscale of the Short Story Task (described below). This criterion was added because a Comprehension subscale score of less than 3 on this measure suggested that participants either did not understand the task

or did not fully participate in the ToM measures, which were the final measures participants completed.

A total of 440 individuals were recruited for the study. Of these, 222 were recruited from the online participant recruitment database, 215 were recruited directly from Craigslist , and 3 were recruited from the previous study on facial emotion recognition in BPD. Of the 440 individuals who set up study appointments, 198 either no-showed or canceled their study appointment. Ninety-one individuals were excluded after the diagnostic interview; of these, 9 were excluded for endorsing current psychotic symptoms; 5 were excluded for meeting criteria for current mania or hypomania; 76 were excluded for being pre-screened as having BPD, but not meeting criteria for BPD during their diagnostic interview; 1 for being pre-screened as not meeting criteria for BPD, but meeting criteria for BPD during the diagnostic interview; and 1 for endorsing current depression (who would have otherwise been in the non-BPD control group). Thirty-four participants were excluded after study completion. Of these, 2 were excluded for not completing baseline surveys; 18 for not completing the mood induction; 5 for not completing the Short Story Task; and 9 for receiving a Short Story Task Comprehension score of less than 3.

The final sample consisted of 142 participants, 61 of which were in the BPD group and 81 of which were in the non-BPD control group. Within the BPD group, 21 participants were randomized to the shame condition, 20 to the sadness condition, and 20 to the boredom condition. Within the non-BPD control group, 26 were randomized to the shame condition, 29 to the sadness condition, and 26 to the boredom condition.

In the sample, 114 participants (80.3%) identified as biologically female and 28 (19.7%) identified as biologically male. The mean age of our sample was 38.1 years (*SD*: 13.4 years, age range: 20 years – 73 years). With respect to sexual orientation, 114 (80.3%) identified as

heterosexual, 6 (4.2%) identified as homosexual, 19 (13.4%) identified as bisexual, and 3 (2.1%) identified as "other." Ninety participants (63.3%) indicated their ethnicity as white/Caucasian, 18 (12.7%) as African American, 13 (9.2%) as Asian, 10 (7.0%) as Hispanic/Latino, 10 (7.0% as biracial, and 1 (.7%) as "other."

Measures

Diagnostic Interview. Participants were given the option to complete the diagnostic interview by Google Hangouts or by Skype; doing the interview by phone was presented as an option only when participants refused or indicated that they would strongly prefer not to utilize a video conferencing platform. The diagnostic interview was administered to determine BPD and current depression diagnoses and to rule out participants who either endorsed symptoms of psychosis or who met criteria for current mania or hypomania. Furthermore, for the healthy control group, the diagnostic interview was also utilized to rule out participants with current depression. At the beginning of the interview, participants were asked several questions pertaining to demographics (age, date of birth, and biological sex). During the interview, participants were screened for: past or current psychosis using the APA psychosis screening items for DSM-5 (APA, 2013); past or current mania and hypomania using the mania/hypomania module of the Mini International Neuropsychiatric Interview (MINI; Sheehan et al., 1998); current depression using the current depression module of the MINI (Sheehan et al., 1998); and BPD using the BPD module of the SCID-5 PD (First et al., 2015).

Emotion Dysregulation. The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) is a 36-question self-report measure of emotion regulation strategies on a 1 (*almost never*) to 5 (*almost always*) Likert-type scale. The DERS yields scores for the following subscales: nonacceptance of emotional responses, difficulties engaging in goal-directed behavior,

impulse control difficulties, lack of emotional awareness, limited access to emotion regulation strategies, and lack of emotional clarity. The DERS has demonstrated high internal consistency (α = .93; Gratz & Roemer, 2004). High internal consistency was found for the present sample (α = .97).

Identity Disturbance. The Borderline Identity Disturbance Self-Report (BIDS; Neacsiu, Herr, Fang, Rodriguez, & Rosenthal, 2015) is a 7-item self-report measure that assesses identity disturbance on a 1 (*false*) to 4 (*very true*) Likert-type scale. The BIDS has demonstrated good internal consistency in a sample of undergraduates (α = .82; Neacsiu et al., 2015). For the present sample, high internal consistency was found (α = .93).

Empathy. The Interpersonal Reactivity Index (IRI; Davis, 1980; 1983) is a 28-item self-report measure that assesses empathy on a 1(*does not describe me well*) to 5 (*describes me very well*) Likert-type scale, using the following subscales: fantasy, perspective-taking, empathic concern, and personal distress. Participants completed a partial version of the IRI containing the perspective-taking and empathic concern subscales and a total of 14 items. All subscales have demonstrated adequate internal consistency (α = .68 - .79; Davis, 1980). In the present study, the perspective-taking subscale and the empathic concern subscale both demonstrated high internal consistency (α = .87 and α = .85, respectively).

Trait Shame. The Test of Self-Conscious Affect-Version 3, Short Version (TOSCA-3S; Tangney, Dearing, Wagner, & Gramzow 2000) is a scenario-based self-report measure that assesses levels of trait shame and trait guilt. The TOSCA-3S is a shortened version of the TOSCA-3 that includes 11 negative scenarios and omits the positive scenarios and pride scales. Each scenario in the TOSCA-3 is presented with three possible reactions that correspond to three subscales: trait-shame, trait-guilt, and tendency to blame others. Participants are asked to rate

each possible reaction on a Likert-type scale ranging from 1 (*not likely*) to 5 (*very likely*). The shame and guilt scales in the shortened version have been shown to have high reliabilities (α = .94 and α = .93, respectively) with the full versions of the scale, thereby supporting the use of the shortened measure (Tangney & Dearing, 2002). High internal consistency was found in the present sample for the trait-shame (α = .86) and trait-guilt (α = .80) subscales, and moderate internal consistency was found for the tendency to blame others subscale (α = .72).

Rejection Sensitivity. The Rejection Sensitivity Questionnaire-Adult Version (A-RSQ; Berenson et al., 2009) is a scenario-based self-report measure that is an adaptation of the Rejection Sensitivity Questionnaire (RSQ; Downey & Feldman, 1996). For each of the nine scenarios presented, participants' rejection concern was assessed using a 1 (*very unconcerned*) to 7 (*very concerned*) Likert-type scale, and participants' rejection expectancy is assessed using a 1 (*very unlikely*) to 7 (*very likely*) Likert-type scale. The A-RSQ has been shown to have acceptable reliability (α = .74; Berenson et al., 2009). In the present study, high internal consistency was found (α = .84).

State Shame. The State Shame and Guilt Scale (SSGS; Marschall, Sanftner, & Tangney, 1994) is a 15-item self-report measure consisting of items that evaluate participants' current feelings of shame, guilt, and pride. Each of the three subscales (shame, guilt, and pride) consists of five items. Questions are rated on a Likert-type scale ranging from 1(*not feeling this way at all*) to 5(*feeling this way very strongly*). In this study, this measure was used to assess participants' state shame prior to and immediately following the mood induction. Thus, participants completed this measure twice, just before the mood induction (State Shame Time 1), and just after the mood induction (State Shame Time 2). The shame, guilt, and pride subscales have all demonstrated good reliability (α = .89, α = .82, and α = .87, respectively; Marschall et

al., 1994). Averaged across both administrations of the measure, high internal consistency was found for the shame (α = .93), guilt (α = .92), and pride (α = .93) subscales.

State Positive and Negative Affect. The Positive and Negative Affect Schedule-Expanded Form (PANAS-X; Watson & Clark, 1994) is a 60-item self-report measure that uses a 1(*very slightly or not at all*) to 5 (*extremely*) Likert-type scale to evaluate two higher-order scales, positive affect and negative affect, as well as 11 specific affects: fear, sadness, guilt, hostility, shyness, fatigue, surprise, joviality, self-assurance, attentiveness, and serenity. Participants completed a shortened 23-item version before (PANAS-X Time 1) and after (PANAS-X Time 2) the mood induction, consisting of items from the following subscales: sadness, hostility, attentiveness, and general negative affect. Negative affect, sadness, and hostility have all demonstrated good reliabilities (α = .85-.90, .87, and.85, respectively), and attentiveness has demonstrated acceptable reliability (α = .72; Watson & Clark, 1994; Baggozi, 1993). Averaged across both administrations of the measure, high internal consistency was found for the sadness (α = .96), hostility (α = .94), attentiveness (α = .84), and general negative affect (α = .96) subscales.

Affective Theory of Mind. The "Reading the Mind in the Eyes" Test-Revised Version (RMET; Baron-Cohen et al., 2001) assesses affective theory of mind by presenting participants with 36 black-and-white photographs of the eye region of faces of actors. Below each image are four mental state words. Participants are instructed to select the word that best describes what the person in the picture is thinking or feeling. This task has demonstrated sensitivity to subtle differences in ToM abilities among nonclinical adult populations (e.g., Baron-Cohen et al., 2001). Correct responses were summed, such that participants could earn a maximum score of 36.

Affective/Cognitive Theory of Mind. The Short Story Task (SST; Dodell-Feder et al., 2013) assesses ToM by asking questions about the implied mental states of characters in a short story. Participants began by reading a short story, *The End of Something* by Ernest Hemingway. Once they finished reading the story and were ready to proceed, participants clicked the page to advance to the questions they answered. Participants received the following prompt: "Please answer the following questions about the story. For most of the questions, there are no right or wrong answers and the questions can be answered with short responses. We're also interested in what you believe to be the character's thoughts, feelings, and intentions when it applies to the question." Participants had the option of downloading a copy of the story so that they could refer to it while they were answering the questions if needed. Participants answered 11 questions in total pertaining to mental state reasoning (eight questions) and comprehension of the story and non-mental-state events (three questions). Comprehension questions were included to assess individuals' understanding of the non-mental state content of the story; this was used to ensure that low mental state reasoning scores were not due to difficulty comprehending the story. For purposes of this study, the short story was amended to improve reading comprehension by decreasing its length and modernizing the language. However, it is important to note that for the original version of the story, the Flesch Reading Ease Score (FRES) is 92.7 on a scale of 0-100 (with higher numbers indicating easier text), and the Flesch-Kincaid Grade Level (FKGL) is 2.8, meaning that it should require a third-grade reading level (Dodell-Feder et al., 2013).

A rubric with possible answer responses was used for scoring responses, with each answer being rated on a 0-2 scale. Regarding questions pertaining to mental state reasoning: a response earned a "0" if it did not contain a reference to a mental state or if the mental state reference was inaccurate; a "1" if it demonstrated either understanding of only one character's

perspective or an incomplete understanding of a character's mental state; or a "2" if it demonstrated understanding of multiple characters' perspectives and/or second-order mental state inferences. Regarding questions pertaining to comprehension questions: a response earned a "0" if it is inaccurate; a "1" if it demonstrated only partial understanding of the story's non-mental-state content; or a "2" if it demonstrated full understanding of the story's non-mental-state content. Therefore, participants could earn a maximum score of 16 on the mental state reasoning questions and a maximum score of 6 on the comprehension questions.

Responses to the SST were de-identified before scoring, such that coders will blind to group (BPD versus non-BPD) and condition (shame mood induction versus sad mood induction versus bored mood induction). All of participants' SST responses were scored by three independent raters, the primary investigator and two research assistants trained in the scoring of the SST. Ratings used were based on agreement between raters. If two or more raters had agreement with respect to rating, that rating was used as the final rating for that particular response. If all three raters disagreed with respect to rating, then the average rating was used. As there were three raters and only three possible ratings for each response (0, 1, 2), if all three raters disagreed, the average of their ratings was 1. Therefore, items exhibiting disagreement among all three raters were given a final rating of 1. Raters all agreed on 1022 of the ratings (65.4%), two raters agreed on 509 of the ratings (32.6%), and no raters agreed on 31 (2%) of the ratings.

Procedure

This study took place entirely online. Individuals from the online recruitment database and individuals who completed a series of online screeners in response to the study-specific Craigslist ads were recruited using the same criteria. Specifically, individuals whose MSI-BPD

scores were greater than or equal to 7 or lesser than or equal to 2 (in conjunction with exclusionary criteria outlined above) were contacted via email about participation in the present study. Potential participants who participated in a previous study on facial emotion recognition in individuals with BPD were also contacted by email to see if they were interested in the present study. Individuals who expressed interest in participating were asked to schedule a time to participate. They were told that they would need to have a 90-minute window of time with Internet access to participate in the study. They were given the opportunity to elect to do the diagnostic interview by Skype, Google Hangouts, or phone.

Participants first completed the diagnostic interview via Skype, Google Hangouts, or phone with the primary investigator of this study or the primary investigator of the larger study within which this study is subsumed, both of whom are advanced doctoral students trained in clinical interviewing and assessment. Upon completion of the diagnostic interview, the interviewer determined whether the participant was eligible to complete the study. Ineligible participants were immediately debriefed and received $3 in amazon.com gift cards as compensation. Eligible participants were immediately emailed a link to use to complete the online surveys and tasks. The interviewer remained accessible via Google Hangouts, Skype, or phone until the participant confirmed receipt of the email and that he/she was about to begin.

Participants then completed baseline self-report measures, which included: DERS, BIDS, IRI, TOSCA-3S, and A-RSQ, as well as additional measures that were part of a larger study. Participants then underwent a mood induction (described below). To evaluate the effects of the mood induction, state shame, sadness, and negative affect were measured at two time points: just before the mood induction (referred to as "Shame Time 1," "Sadness Time 1," and "Negative Affect Time 1," respectively) via completion of the SSGS Time 1 and PANAS-X Time 1, and

just after the mood induction (referred to as "Shame Time 2," "Sadness Time 2," and "Negative Affect Time 2," respectively), via completion of the SSGS Time 2 and PANAS-X Time 2.

Next, participants completed two ToM tasks, one measuring affective ToM and one measuring affective and cognitive ToM. The RMET (Baron-Cohen et al., 2001) was used to assess affective ToM. Specifically, this test assesses the first stage of attribution of theory of mind, which is attribution of the relevant mental state. The RMET consists of a series of black-and-white images of the eye region of faces and four mental state options for each and asks participants to select the mental state that best describes what the person in the picture is thinking or feeling. Several studies have shown that individuals with BPD do not exhibit theory of mind deficits in simple affective ToM tasks such as the RMET under normal conditions (e.g., Peterson et al., 2016; Schilling et al., 2012). Thus, this task was selected because of its ability to isolate the effects of a mood induction on ToM performance, subsequently strengthening our ability to draw conclusions about the effects of state shame on ToM in BPD.

Participants then completed the SST (Dodell-Feder et al., 2013), which was used as an assessment of both affective and cognitive ToM. Participants read a short story (*The End of Something* by Ernest Hemingway) about a nuanced interaction in which the male protagonist breaks up with the female protagonist, and then answer a series of short-answer questions about what they have read. Characters' mental states are implied without being explicitly stated, thereby requiring participants to reason about characters' cognitions and emotions and incorporate information from the social context as well into their understanding of the characters. There are opportunities for readers to make first-order mental state inferences about a single character's beliefs, desires, wishes, etc., as well as second-order mental state inferences about what the reader believes a character thinks or feels about another character's mental state.

Methodological limitations evident in previous studies on ToM and BPD informed the decision to utilize this ToM task. Specifically, the SST was chosen because it has demonstrated sensitivity to theory of mind abilities in adults without creating ceiling effects and because it incorporates and assesses a range of mental states of differing complexity. The story itself represents a real-world interaction, increasing the task's ecological validity with respect to the types of situations in which adult individuals with and without BPD need to access theory of mind. The SST was the final measure administered in the study. Within 24 hours of study completion, participants were debriefed via email and received $10 in Amazon.com gift cards as compensation. Participants who were excluded after the diagnostic interview were debriefed via email and received $3 in Amazon.com gift cards as compensation within 24 hours of their diagnostic interview.

Mood Induction

All participants were randomized to one of three mood induction conditions: shame mood induction, sad mood induction, or bored mood induction. The mood induction for the sadness and shame conditions was an autobiographical memory recall procedure that is similar to that used by de Hooge, Zeelenberg, and Bruegelmans (2010) and Pinto-Gouveia, Castilho, Matos, and Xavier (2013). All three conditions lasted for five minutes; once five minutes passed, the screen automatically proceeded to the next survey (SSGS Time 2).

Shame Mood Induction. Individuals in the shame mood induction were given the following instructions: "Please try to recall a significant situation or experience in which you felt shame. Shame is an emotion we experience when we feel humiliated, rejected, criticized, inferior, incompetent, abandoned, or worthless. It is best if you think of an event that was significant for you and had a major impact on your development as a person. Please think back

upon that significant event in your life and spend about five minutes writing about the event. There is a timer at the bottom to let you know how much time you have remaining. It is okay if you do not finish. If you finish writing before five minutes have passed, please re-read what you wrote." There was a text box below the prompt, in which participants typed their response.

Sad Mood Induction. Individuals in the sad mood induction were given the following instructions: "Please try to recall a significant situation or experience in which you felt sadness. Sadness is an emotion we experience when we lose something or someone important to us or when a situation is not what we wanted or expected and hoped it would be. It is best if you think of an event that was significant for you and had a major impact on your development as a person. Please think back upon that significant experience in your life and spent about five minutes writing about the event. There is a timer at the bottom to let you know how much time you have remaining. It is okay if you do not finish. If you finish writing before five minutes have passed, please re-read what you wrote." There was a text box below the prompt, in which participants typed their response.

Bored Mood Induction. Individuals in the bored mood induction were given the following instructions: "Please read the following paragraph and type it into the space below. There is a timer at the bottom to let you know how much time you have remaining. It is okay if you do not finish. If you finish before five minutes have passed, please re-read the paragraph." A brief paragraph on the history of the airplane followed, with a text box below it in which participants typed their response.

CHAPTER 3

RESULTS

Descriptive statistics were calculated for age and variables used in primary and exploratory analyses for the sample as a whole, as well as separately for the BPD and non-BPD diagnostic groups, as well as for the experimental conditions (see Tables 1 and 2). There were no diagnostic group or experimental conditional effects on the SST Comprehension subscale. This suggests that participants across diagnostic groups and experimental conditions did not exhibit significant differences with respect to their ability to understand the SST task. It is also important to note that the mean State Shame Time 2 score for the non-BPD control group was 6.49. Given that the minimum possible score participants can receive for State Shame Time 2 is 5, this suggests that floor effects may have impacted the efficacy of the mood induction for individuals in the non-BPD control group.

Table 1: Descriptive Statistics for Age and Study Variables Used in Analyses, Including the Overall Means as Well as the Means for the Variables within Each Diagnostic Group.

	Overall mean (*SD*)	**BPD group mean (*SD*)**	**Non-BPD control group mean (*SD*)**	**Groupwise comparisons *p* value**
Age	38.06 (13.41)	37.25 (12.80)	38.68 (13.90)	.53
TOSCA-S	33.77 (9.82)	40.02 (8.05)	29.06 (8.31)	<.01**
BIDS	12.94 (6.44)	18.87 (5.11)	8.47 (2.53)	<.01**
DERS	83.86 (33.12)	114.31 (23.36)	60.92 (16.87)	<.01**
RSQ	14.52 (8.00)	20.37 (7.16)	10.02 (5.23)	<.01**
State Shame	9.51 (6.00)	14.18 (6.12)	5.99 (2.47)	<.01**
State Shame	9.98 (6.30)	14.61 (6.27)	6.49 (3.44)	<.01**
State Sadness	11.56 (6.76)	16.75 (5.65)	7.64 (4.53)	<.01**
State Sadness	12.25 (7.27)	17.52 (6.16)	8.27 (5.25)	<.01**
State Negative	20.08 (11.94)	28.33 (11.10)	13.86 (8.23)	<.01**
State Negative	21.18 (12.85)	29.89 (11.77)	14.62 (9.27)	<.01**
RMET	26.20 (4.90)	25.23 (5.29)	26.94 (4.48)	.039**
SST Comp.	5.23 (.97)	5.11 (1.00)	5.31 (.94)	.24
SST ToM	8.03 (3.29)	7.60 (3.54)	8.35 (3.07)	.19

** = statistically significant ($p < .05$)

Table 2: Descriptive Statistics for Age and Study Variables Used in Analyses Based on Experimental Condition.

	Shame condition mean (*SD*)	**Sadness condition mean (*SD*)**	**Boredom condition mean (*SD*)**	**Groupwise comparisons *p* value**
Age	41.77 (13.94)	35.04 (14.08)	37.50 (11.34)	.045**
TOSCA-S	32.94 (9.76)	33.80 (9.71)	34.59 (10.12)	.72
BIDS	13.57 (6.96)	12.33 (5.69)	12.93 (6.70)	.64
DERS	87.87 (34.97)	81.54 (32.77)	82.22 (31.88)	.60
RSQ	16.60 (9.43)	13.00 (7.24)	13.98 (6.78)	.077
State Shame	9.96 (6.90)	8.55 (4.39)	10.07 (6.48)	.39
State Shame	10.40 (6.86)	10.00 (5.64)	9.52 (6.48)	.80
State Sadness	12.38 (7.47)	10.24 (5.60)	12.11 (7.06)	.24
State Sadness	12.70 (7.61)	12.39 (6.86)	11.63 (7.47)	.77
State Negative	21.49 (13.60)	17.78 (9.14)	21.09 (12.63)	.25
State Negative	22.89 (14.55)	20.12 (10.67)	20.54 (12.85)	.53
RMET	25.47 (5.29)	27.51 (3.95)	25.57 (5.21)	.069
SST Comp.	5.26 (.92)	5.20 (1.02)	5.22 (.99)	.97
SST ToM	7.87 (3.30)	8.49 (3.23)	7.70 (3.30)	.47

** = statistically significant ($p < .05$)

As noted previously, 80.3% of the sample identified as biologically female. I calculated sex differences by diagnostic group as well as by experimental condition:

Table 3: Descriptive Statistics with Respect to Biological Sex between Diagnostic Groups.

	Number of males	**Number of females**	**Total**
BPD group	8	53	61
Non-BPD control group	20	61	81
Total	28	114	142

Table 4: Descriptive Statistics with Respect to Biological Sex Among Experimental Conditions.

	Number of males (percentage of condition)	**Number of females (percentage of condition)**	**Total**
Shame condition	6	41	47
Sadness condition	12	37	49
Boredom condition	10	36	46
Total	28	114	142

Sex differences between diagnostic groups was not significant, with $\chi^2 = .086$. Sex differences among experimental conditions was also not significant, with $\chi^2 = .32$. However, given that the majority of the sample was female, as well as the fact that mean age was significantly different among the experimental groups, I decided to assess whether age and/or biological sex should be included as control variables by evaluating whether theory of mind, as measured by the RMET and SST ToM, varied by age and/or sex, respectively. With respect to age, the relationship was not significant for the RMET, $F(1, 140) = .600$, $p = .44$, nor was it significant for the SST ToM, $F(1, 140) = .133$, $p = .716$. With respect to biological sex, the relationship was not significant for the RMET, $F(1, 140) = .041$, $p = .84$, nor was it significant

for the SST ToM, $F(1, 140) = .00$, $p = .99$. Therefore, I decided not to control for age or biological sex in the analyses. Bivariate correlations among all predictor and outcome variables were also calculated:

Table 5: Bivariate Correlations Among Predictor and Outcome Variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13
1.TOSCA-S	33.77 (9.82)	.60**	.71**	.65**	.59**	.60**	.51**	.54**	.47**	.49**	.02	.01	.07
2. BIDS	.60**	12.94 (6.44)	.85**	.67**	.72**	.64**	.70**	.65**	.68**	.62**	.20**	-.07	-.13
3. DERS	.71**	.85**	83.86 (33.12)	.73**	.76**	.70**	.75**	.70**	.73**	.66**	-.16	-.11	-.14
4. RSQ	.65**	.67**	.73**	14.53 (8.00)	.71**	.70**	.69**	.66**	.61**	.61**	-.04	-.02	-.06
5. State Shame T1	.59**	.72**	.76**	.71**	9.51 (6.00)	.85**	.77**	.71**	.74**	.69**	.21**	-.07	-.11
6. State Shame T2	.60**	.64**	.70**	.70**	.85**	9.98 (6.30)	.71**	.79**	.67**	.76**	-.13	-.05	-.09
7. State Sadness T1	.51**	.70**	.75**	.69**	.77**	.71**	11.56 (6.76)	.85**	.90**	.80**	-.11	.01	-.16
8. State Sadness T2	.54**	.65**	.70**	.66**	.71**	.79**	.85**	12.25 (7.27)	.74**	.88**	-.07	-.03	-.08
9. State Neg Aff T1	.47**	.68**	.73**	.61**	.74**	.67**	.90**	.74**	20.08 (11.94)	.84**	.19**	-.07	.26**
10. State Neg Aff T2	.49**	.62**	.66**	.61**	.69**	.76**	.80**	.88**	.84**	21.18 (12.85)	.19**	-.10	.24**
11. RMET	.02	.20**	-.16	-.04	.21**	-.13	-.11	-.07	-.19**	-.19**	26.20 (4.90)	.34**	.49**
12. SST Comp	.01	-.07	-.11	-.02	-.07	-.05	.01	-.03	-.07	-.10	.34**	5.23 (.97)	.39**
13. SST ToM	.07	-.13	-.14	-.06	-.11	-.09	-.16	-.08	-.26**	-.24**	.49**	.39**	8.03 (3.29)

** = statistically significant ($p < .05$)

I conducted manipulation checks to assess the efficacy of the mood inductions. Specifically, I conducted a series of two-way ANOVAS with diagnostic group (BPD versus non-BPD control) and experimental condition (shame versus sadness versus boredom) as between-groups factors and the Time 2 state emotions as the outcome variable, with the corresponding Time 1 state emotion as the control variable. For manipulation check analysis 1, which analyzed the degree to which shame was induced by the different experimental conditions, I conducted a two-way ANOVA with Shame Time 1 (immediately before the mood induction) as the control variable and Shame Time 2 (immediately after the mood induction) as the outcome variable. Results indicated that the relationship between experimental condition and Shame Time 2 was

significant, $F(1, 136) = 3.47$, $p = .023$. Neither the relationship between diagnostic group and Shame Time 2, $F(1, 136) = 2.87$, $p = .093$, nor the interaction between experimental condition and diagnostic group and Shame Time 2, $F(2, 136) = .089$, $p = .915$, was significant. I conducted post hoc pairwise comparisons between different experimental conditions. I found that the effect of the shame condition on Shame Time 2 was not significantly different from the effect of the sadness condition on Shame Time 2 ($p = .237$), nor was it significantly different from the effect of the boredom condition on Shame Time 2 ($p = .145$). However, I found that the effect of the sadness condition on Shame Time 2 was significantly different from the effect of the boredom condition on Shame Time 2 ($p = .010$). Therefore, the results suggested that the sadness condition induced significantly more shame than did the boredom condition, whereas the amount of shame that the shame condition induced was not significantly different from either of the other two experimental conditions.

For manipulation check analysis 2, which analyzed the degree to which sadness was induced by the different experimental conditions, I conducted a two-way ANOVA with Sadness Time 1 (immediately before the mood induction) as the control variable and Sadness Time 2 (immediately after the mood induction) as the outcome variable. Results indicated that the relationship between experimental condition and Sadness Time 2 was significant, $F(1, 136) = 5.57$, $p = .005$. Neither the relationship between diagnostic group and Sadness Time 2, $F(1, 136) = 1.92$, $p = .168$, nor the interaction between experimental condition and diagnostic group and Sadness Time 2, $F(2, 136) = 1.38$, $p = .255$, was significant. I conducted post hoc pairwise comparisons between different experimental conditions. I found that the effect of the sadness condition on Sadness Time 2 was significantly different from both the effects of the shame condition on Sadness Time 2 ($p = .021$) and the effects of the boredom condition on Sadness

Time 2 (p = .002), in that Sadness Time 2 was significantly higher for participants in the sadness Condition as compared with participants in the shame Condition as well as participants in the boredom Condition. The effect of the shame condition on Sadness Time 2 was not significantly different from the effect of the boredom condition on Sadness Time 2 (p = .359). Therefore, the findings demonstrate that the sadness condition induced significantly more sadness than either the shame condition or the boredom condition did.

For manipulation check analysis 3, which analyzed the degree to which negative affect was induced by the different experimental conditions, I conducted a two-way ANOVA with Negative Affect Time 1 (immediately before the mood induction) as the control variable and Negative Affect Time 2 (immediately after the mood induction) as the outcome variable. Results indicated that the relationship between experimental condition and Negative Affect Time 2 was not significant, $F(1, 136) = 1.62$, p = .201, and the interaction between experimental condition and diagnostic group and Negative Affect Time 2 was also not significant, $F(2, 136) = .74$, p = .480. However, the findings showed that the relationship between diagnostic group and Negative Affect Time 2 was significant, $F(1, 136) = 4.37$, p = .038, such that participants in the BPD had significantly higher Negative Affect Time 2 than did participants in the non-BPD control group.

I evaluated Hypothesis 1 by conducting a two-way ANOVA with diagnostic group (BPD versus non-BPD control) and experimental condition (shame mood induction versus sad mood induction versus bored mood induction) as between-subjects factors and theory of mind (RMET for Hypothesis 1a and SST Theory of Mind score for Hypothesis 1b) as the outcome variable. With respect to Hypothesis 1a, the interaction between diagnostic group and experimental condition and RMET was nonsignificant, $F(2, 136) = .74$, p = .480. However, the relationship between diagnostic group and RMET was significant, $F(1, 136) = 4.21$, p = .042, as was the

relationship between experimental condition and RMET, $F(1, 136) = 2.97$, $p = .054$ (see Figure 1a).

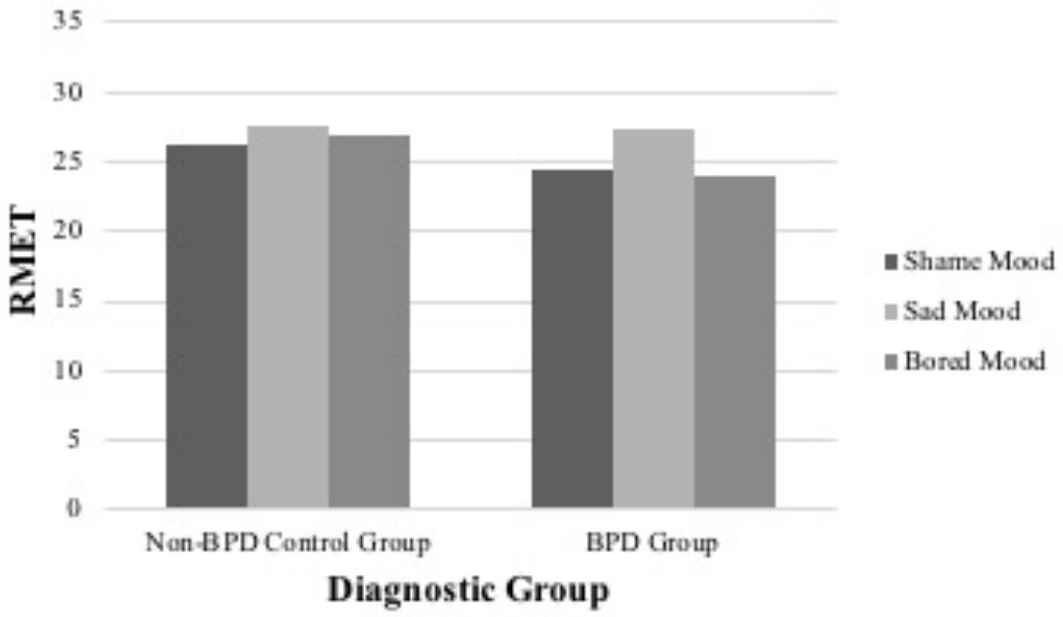


Figure 1a: Interaction between Diagnostic Group, Experimental Condition, and RMET.

I ran a follow-up regression analysis to assess the effect of diagnostic group on RMET when controlling for experimental condition, $F(3, 138) = 3.24$, $B = -1.65$, $p = .044$. This means that, on average, individuals with BPD scored 1.65 points lower on the RMET than did individuals without BPD, when controlling for experimental group. Posthoc analyses indicated that, with respect to experimental condition, participants in the sadness condition scored significantly higher on the RMET than did participants in both the shame condition ($p = .039$) and the boredom condition ($p = .05$). However, there was not a significant difference in the RMET scores for participants in the shame condition, as compared to participants in the boredom condition ($p = .92$).

With respect to Hypothesis 1b, the interaction between diagnostic group and experimental condition and SST Theory of Mind (SST ToM) was nonsignificant, $F(2, 136) =$

.94, p = .392. Additionally, the relationship between diagnostic group and SST ToM was nonsignificant, $F(1, 136) = 1.74$, p = .189, as was the relationship between experimental condition and SST ToM, $F(1, 136) = .99$, p = .373 (see Figure 1b).

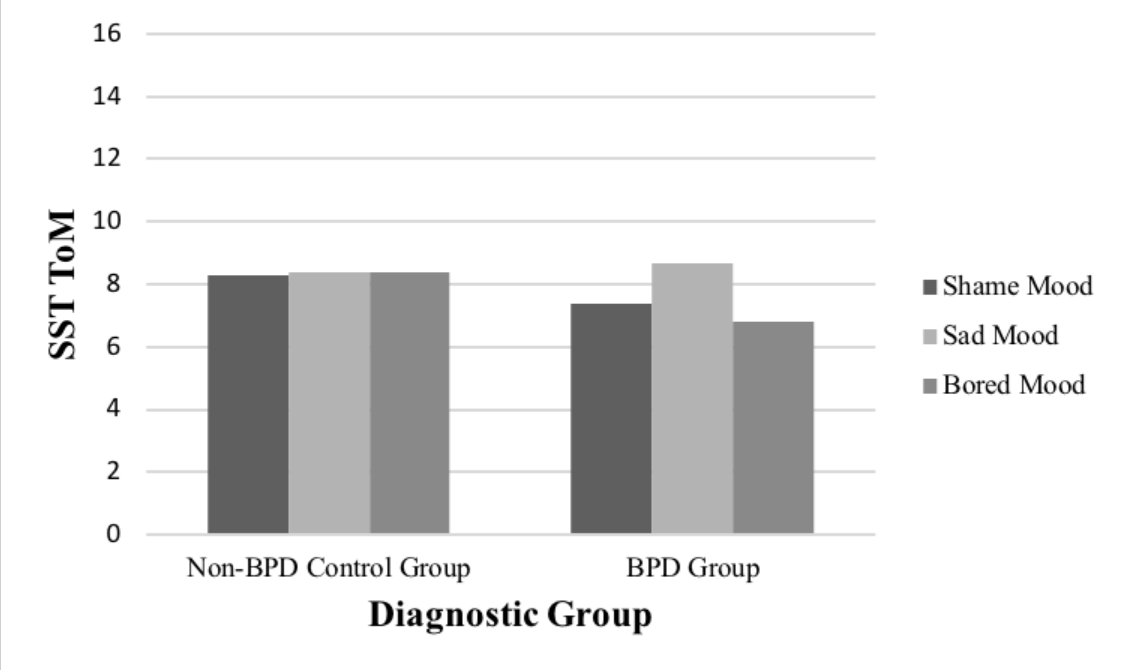


Figure 1b: Interaction between Diagnostic Group, Experimental Condition, and SST ToM.

I evaluated Hypothesis 2 using the PROCESS macro for SPSS (Hayes, 2013) to conduct a moderated mediation analysis with 10,000 bootstrapping samples to determine whether the relationship between diagnostic group (BPD versus non-BPD control) and theory of mind (RMET for Hypothesis 2a and SST ToM for Hypothesis 2b) was mediated by identity disturbance (as measured by the BIDS) and trait shame (as measured by the TOSCA-S) and moderated by experimental condition (shame mood induction versus sad or bored mood induction). As both the sad and bored mood inductions were intended to be control conditions, I dichotomized my moderating variable such that it was the shame mood induction versus both the sad and bored mood inductions. Specifically, I tested Model 14 (Hayes, 2013) in the analyses. With respect to Hypothesis 2a, the results of this analysis did not support the predicted

moderated mediation model. Specifically, the direct effect of diagnostic group on RMET score was not significant, with a path coefficient of -1.10 (*SE* = 1.39), *p* = .43. Diagnostic group did predict BIDS score, with a path coefficient of 10.4 (*SE* = .65), *p* <.01, as well as TOSCA-S, with a path coefficient of 10.95 (*SE* = 1.39), *p* < .01. However, after controlling for diagnostic group, BIDS score did not predict RMET score, with a path coefficient of -.13 (*SE* = .13), *p* = .34, nor did TOSCA-S predict RMET score, with a path coefficient of .09 (*SE* = .06), *p* = .16. The interaction between BIDS score and experimental condition was not significant, with *B* = -.15 *(SE* = .17), *p* = .36, and the interaction between TOSCA-S and experimental condition was also not significant, with *B* = .07 (*SE* = .11), *p* = .51. Subsequently, the indirect effect of diagnostic group on RMET score through BIDS score, when moderated by experimental condition, was not significant, with a path coefficient of -1.57 (Boot *SE* = 2.05; 95% CI = -5.45, 2.54). Similarly, the indirect effect of diagnostic group on RMET score through TOSCA-S, when moderated by experimental condition, was not significant, with a path coefficient of .81 (Boot *SE* = 1.29; 95% CI = -1.76, 3.29; see Figure 2a).

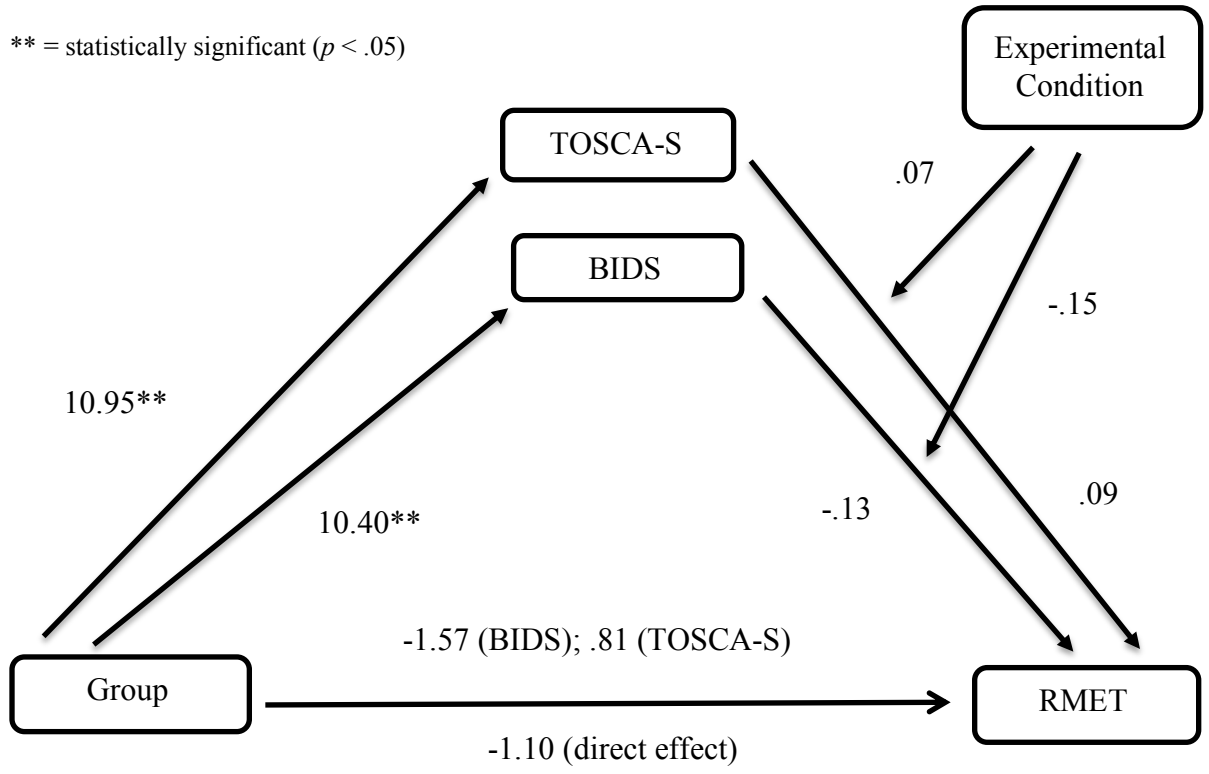


Figure 2a: Moderated Mediation Analysis to Assess Whether the Relationship between Diagnostic Group and RMET is Mediated by Trait Shame and Identity Disturbance and Moderated by Experimental Condition.

With respect to Hypothesis 2b, the results of this analysis did not support the predicted moderated mediation model. Specifically, the direct effect of diagnostic group on SST ToM score was not significant, with a path coefficient of -.38 (*SE* = .95), $p = .69$. Diagnostic group did predict BIDS score, with a path coefficient of 10.4 (*SE* = .65), $p < .01$, as well as TOSCA-S, with a path coefficient of 10.95 (*SE* = 1.39), $p < .01$. However, after controlling for diagnostic group, BIDS score did not predict SST Theory of Mind score, with a path coefficient of -.13 (*SE* = .09), $p = .14$. After controlling for diagnostic group, TOSCA-S did predict SST Theory of Mind score, with a path coefficient of .10 (*SE* = .04), $p = .02$. The interaction between BIDS score and experimental condition was not significant, with $B = .06$ (*SE* = .11), $p = .57$, and the interaction between TOSCA-S and experimental condition was also not significant, with $B = -.07$ (*SE* = .08), $p = .37$. Subsequently, the indirect effect of diagnostic group on SST Theory of Mind score

through BIDS, when moderated by experimental condition, was not significant, with a path coefficient of .66 (Boot *SE* = 1.26; 95% CI = -1.75, 3.16). Similarly, the indirect effect of diagnostic group on SST Theory of Mind score through TOSCA-S, when moderated by experimental condition, was also not significant, with a path coefficient of -.76 (Boot *SE* = .83, 95%CI = -2.41, .84; see Figure 2b).

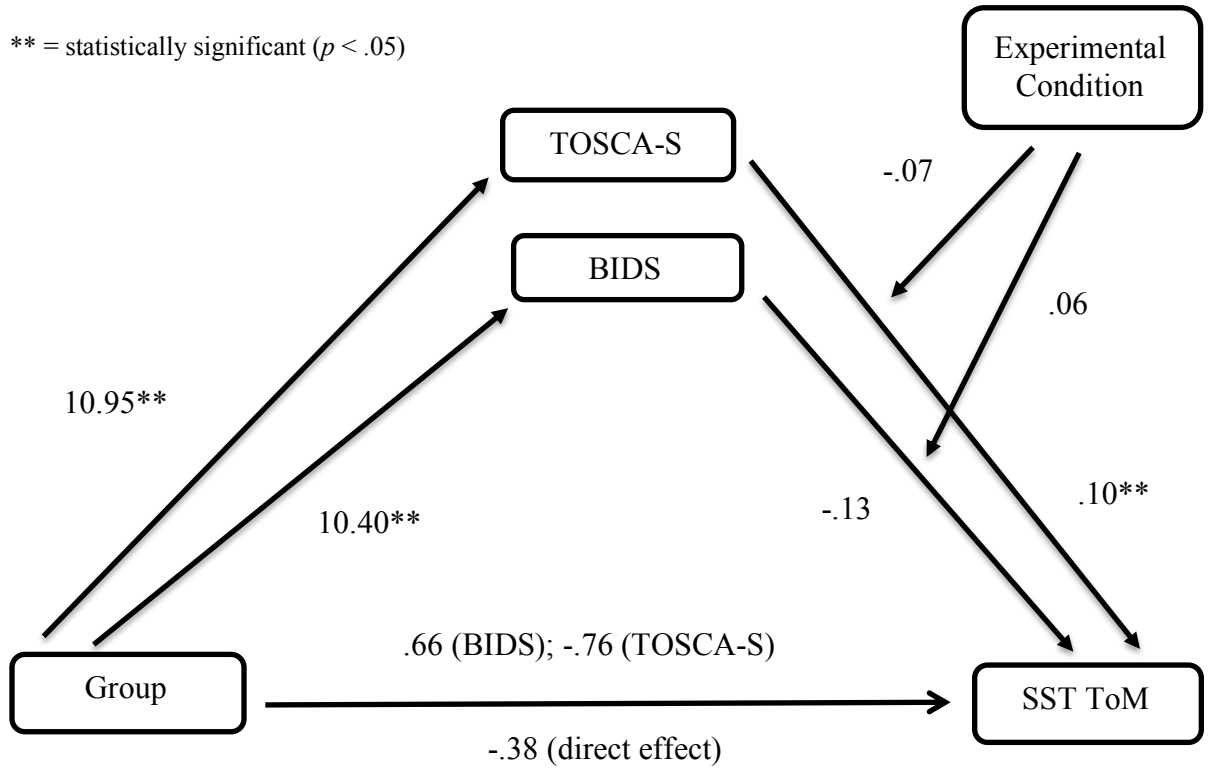


Figure 2b: Moderated Mediation Analysis to Assess Whether the Relationship between Diagnostic Group and SST ToM is Mediated by Trait Shame and Identity Disturbance and Moderated by Experimental Condition.

I evaluated Hypothesis 3 by using the PROCESS macro for SPSS (Hayes, 2013) to conduct a moderated mediation analysis with 10,000 bootstrapping samples to determine whether the relationship between diagnostic group (BPD versus non-BPD control) and theory of mind (RMET for Hypothesis 3a and SST ToM for Hypothesis 3b) was mediated by rejection sensitivity (as measured by the Rejection Sensitivity Questionnaire, RSQ) and moderated by experimental condition (shame mood induction versus sad or bored mood induction). As both the

sad and bored mood inductions were intended to be control conditions, I dichotomized my moderating variable such that it was the shame mood induction versus both the sad and bored mood inductions. Specifically, I tested Model 14 (Hayes, 2013) in the analyses. With respect to Hypothesis 3a, the results of this analysis did not support the predicted moderated mediation model. Specifically, the direct effect of diagnostic group on RMET was significant, with a path coefficient of -3.05 (*SE* = 1.08), $p = .0054$. Diagnostic group did predict RSQ score, with a path coefficient of 10.35 (*SE* = 1.05), $p < .01$. However, after controlling for diagnostic group, RSQ did not predict RMET, with a path coefficient of .15 (*SE* = .09), $p = .09$. The interaction between experimental condition and RSQ total was not significant, with $B = -.067$ (*SE* = .10), $p = .52$. Subsequently, the indirect effect of diagnostic group on RMET total through RSQ, when moderated by experimental condition, was not significant, with a path coefficient of -.69 (Boot *SE* = .96, 95% CI = -2.52, 1.23; see Figure 3a).

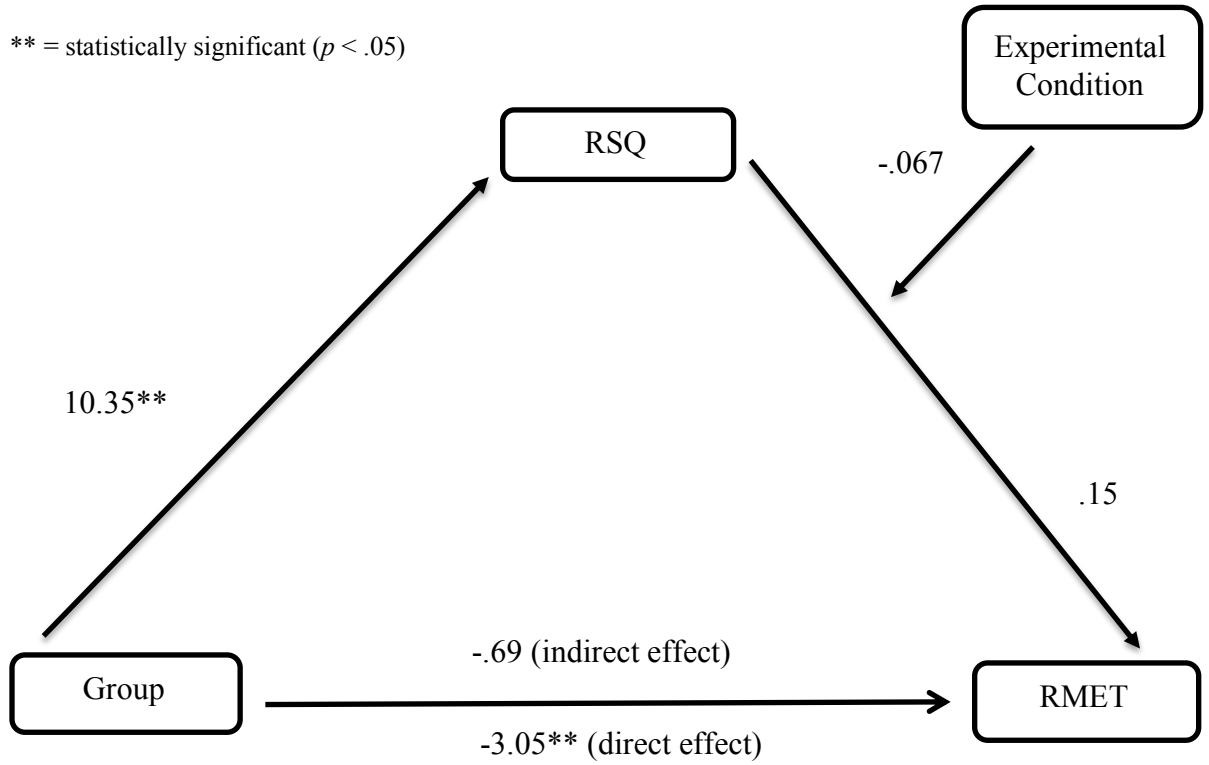


Figure 3a: Moderated Mediation Analysis to Assess Whether the Relationship between Diagnostic Group and RMET is Mediated by Rejection Sensitivity and Moderated by Experimental Condition.

With respect to Hypothesis 3b, the results of this analysis did not support the predicted moderated mediation model. Specifically, the direct effect of diagnostic group on SST ToM was not significant, with a path coefficient of -1.07 (*SE* = .74), $p = .15$. Diagnostic group did predict RSQ score, with a path coefficient of 10.35 (*SE* = 1.05), $p < .01$. However, after controlling for diagnostic group, RSQ did not predict SST ToM, with a path coefficient of .02 (*SE* = .06, $p = .73$). The interaction between experimental condition and RSQ total was not significant, with $B = .0055$ (*SE* = .07), $p = .94$. Subsequently, the indirect effect of diagnostic group on SST ToM through RSQ total, when mediated by rejection sensitivity and moderated by experimental condition was not significant, with a path coefficient of .057 (Boot *SE* = .73; 95% CI = -1.41, 1.49; see Figure 3b).

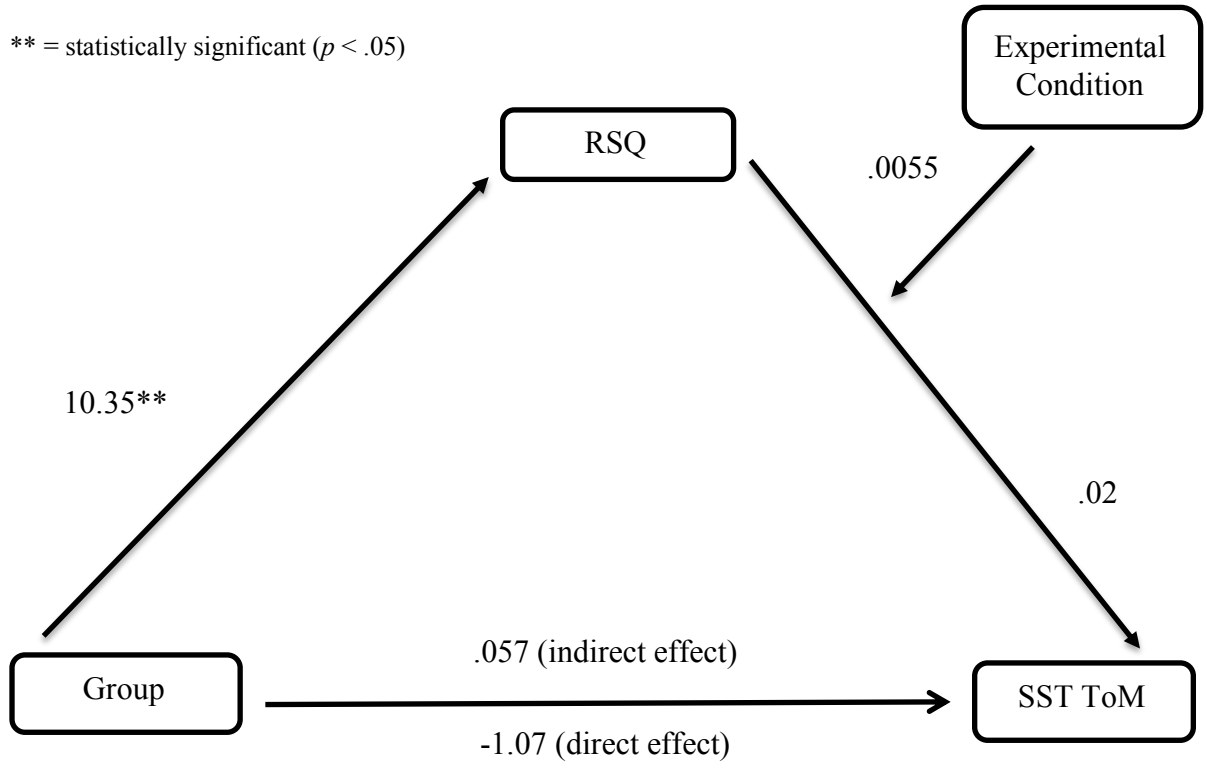


Figure 3b: Moderated Mediation Analysis to Assess Whether the Relationship between Diagnostic Group and SST ToM is Mediated by Rejection Sensitivity and Moderated by Experimental Condition.

As the manipulation checks indicated that the shame mood induction did not function as intended, and the amount of shame induced by the shame mood induction was not significantly different from the amount of shame induced by the sadness or boredom mood inductions, I conducted exploratory analyses to assess variations of the proposed hypotheses with state shame following the mood induction, rather than experimental condition, as the moderator variable in all analyses. With respect to exploratory analyses pertaining to Hypotheses 1a and 1b, we conducted multiple regression analyses using the PROCESS macro for SPSS (Hayes, 2013) to evaluate whether Shame Time 2 moderated the relationship between diagnostic group (BPD versus non-BPD control) and ToM (RMET or SST ToM). State shame did not moderate the relationship between diagnostic group and RMET score, $R^2_{ch} = .0064$, $F(1, 139) = .92$, $B = -.18$,

p = .34, nor did it moderate the relationship between diagnostic group and SST ToM score, R^2_{ch} = .0074, F(1, 139) = 1.05, B = -.13, p = .31.

With respect to exploratory analyses pertaining to Hypotheses 2a and 2b, I conducted moderated mediation analyses using Model 14 (Hayes, 2013) with 10,000 bootstrapping samples to determine whether the relationship between diagnostic group (BPD versus non-BPD control) and theory of mind (RMET or SST ToM) was mediated by identity disturbance and trait shame and moderated by state shame after the mood induction. With respect to RMET, the analyses were nonsignificant. Specifically, the indirect effect of diagnostic group on RMET when mediated by identity disturbance and moderated by state shame was not significant, with a path coefficient of -.09 (Boot *SE* = .16, 95% CI = -.40, .23, and the indirect effect of diagnostic group on RMET when mediated by trait shame and moderated by state shame was not significant, with a path coefficient of .11 (Boot *SE* = .12, 95%CI = -.18, .29). The results were nonsignificant for the SST ToM as well. The indirect effect of diagnostic group on SST ToM when mediated by identity disturbance and moderated by state shame was not significant, with a path coefficient of -.03 (Boot *SE* =.10 , 95% CI = -.23,.15), and the indirect effect of diagnostic group on RMET when mediated by trait shame and moderated by state shame was not significant, with a path coefficient of -.02 (Boot *SE* = .09, 95% CI = -.23,.12).

With respect to exploratory analyses pertaining to Hypotheses 3a and 3b, we used Model 14 of the PROCESS macro for SPSS (Hayes, 2013) to conduct moderated mediation analyses with 10,000 bootstrapping samples to assess whether the relationship between diagnostic group and theory of mind (RMET or SST ToM) was mediated by rejection sensitivity and moderated by state shame after the mood induction. With respect to RMET, the results were nonsignificant. Specifically, the indirect effect of DERS score on RMET when mediated by RSQ total and

moderated by state shame was not significant, with a path coefficient of .15 (Boot *SE* = .10, 95% CI = -.03, .37). However, it is important to note that the interaction between state shame and RSQ total was approaching significance, with *B* = .01 (*SE* = .0084), *p* = .079. Of note, the results were significant for SST ToM; the indirect effect of diagnostic group on SST ToM when mediated by RSQ total and moderated by state shame was significant, with a path coefficient of .11 (Boot *SE* = .0009, 95% CI = .0021, .23). Thus, the findings showed that individuals with BPD scored .11 points higher on the SST ToM, as compared to individuals without BPD, due to the effects that rejection sensitivity have on state shame. The interaction between state shame and RSQ total was approaching significance, with *B* = .01 (*SE* = .0058), *p* = .07, and the direct effect of diagnostic group on SST ToM was nonsignificant, with a path coefficient of -.28 (*SE* = .85), *p* = .74.

As none of the proposed hypotheses around the relationship between BPD, experimental condition, and theory of mind were significant, and nearly all hypotheses (with only one exception) were nonsignificant even when substituting state shame for experimental condition, I decided to increase the scope of my analyses by assessing the effects of state shame on theory of mind across all diagnostic groups (BPD and non-BPD control). To do this, I conducted regression analyses to evaluate the effect of Shame Time 2 on RMET and SST ToM. I decided not to control for Shame Time 1, as I wanted to assess the effect of the amount of shame participants were experiencing just prior to the ToM tasks, rather than assess the effect of the change in state shame that participants experienced after the mood induction. Shame Time 2 did not predict RMET, with $F(1, 140) = 2.44$, $B = -.10$, $p = .12$, nor did it predict SST ToM, with $F(1, 140) = 1.11$, $B = =.05$, $p = .29$. However, when controlling for experimental condition and trait shame, Shame Time 2 significantly predicted lower RMET scores, $F(4, 137) = 2.64$, $B =$ -

.18, p = .028, as well as lower SST ToM scores, $F(4, 137) = 1.47$, B = -.11, p = .05. This indicated that, when controlling for experimental condition and trait shame, every one-point increase in Shame Time 2 predicted a .18-point decrease in RMET score and a .11-point decrease in SST ToM score. Although trait shame did not have a significant effect on either RMET or SST ToM scores as a control variable in these analyses, its coefficient was positive with respect to both the RMET (B = .081, p = .120) and the SST ToM (B = .064, p = .072).

These results suggested that both trait shame and state shame might have an impact on ToM, which led me to re-evaluate the relationship between BPD, shame, and ToM by incorporating both trait and state shame into the analyses. I conducted a series of parallel mediation analyses to assess whether state shame and trait shame mediated the relationship between diagnostic group (BPD vs. non-BPD control) and ToM (RMET or SST ToM), when controlling for experimental condition. With respect to RMET, diagnostic group significantly predicted both TOSCA-S, with a path coefficient of 10.98 (SE = 1.39), p <. 01, as well as Shame Time 2, with a path coefficient of 8.12 (SE = .83), p < .01. After controlling for diagnostic group, TOSCA-S significantly predicted RMET, with a path coefficient of .11 (SE = .05), p = .044, but Shame Time 2 did not significantly predict RMET, with a path coefficient of -.10 (SE = .090), p = .26. The indirect effect of diagnostic group on RMET through trait shame was significant, with a path coefficient of 1.19 (Boot SE = .61, 95% CI = .046, 2.44); however, the indirect effect of diagnostic group on RMET through state shame was not significant, with a path coefficient of -.83 (Boot SE = .79, 95% CI = -2.38, .73). The direct effect of diagnostic group on RMET was approaching significance, with a path coefficient of -.2.01 (SE = 1.09), p = .068 (see Figure 4a).

** = statistically significant ($p < .05$)

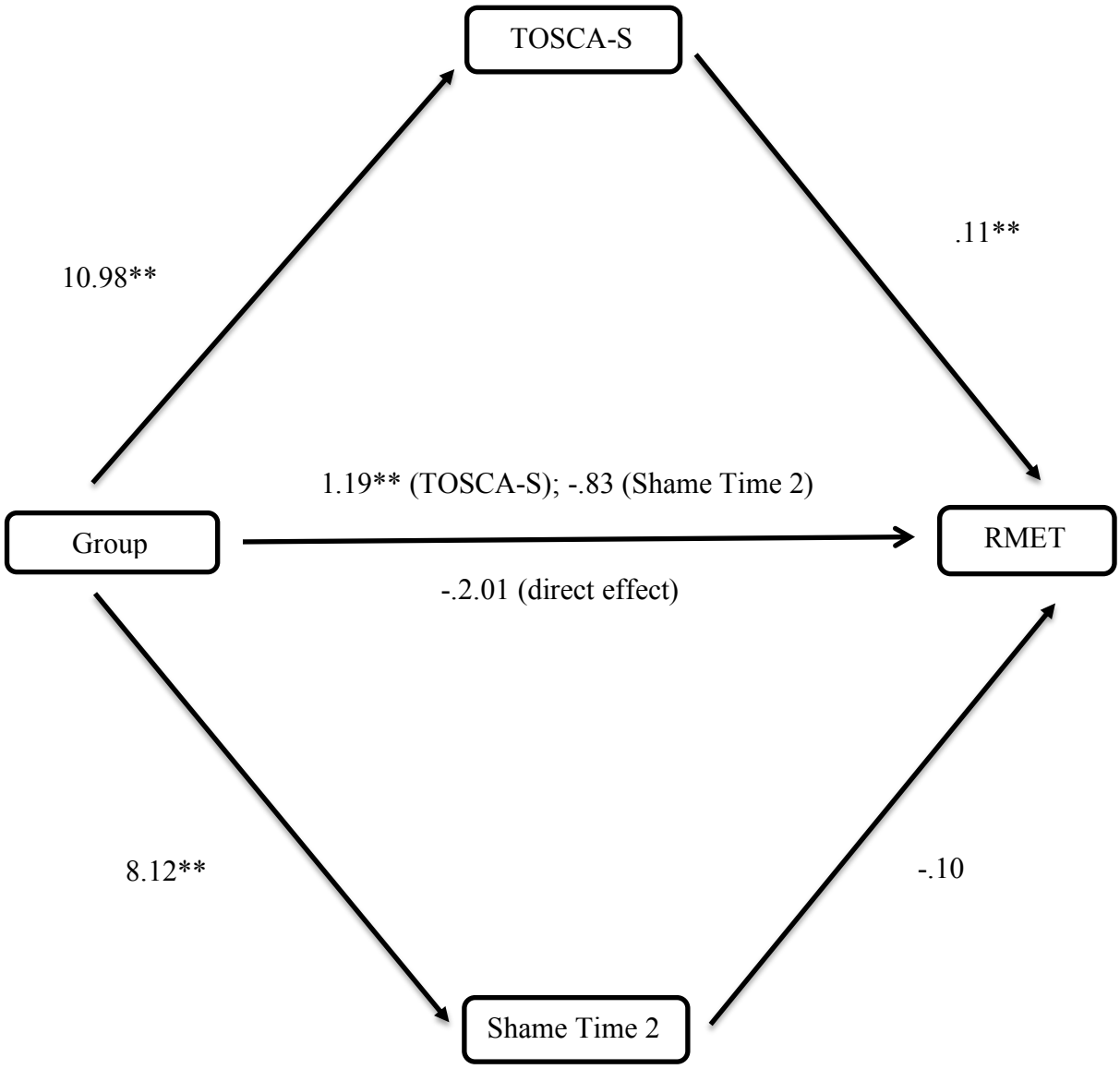


Figure 4a: Parallel Mediation Analysis to Assess Whether the Relationship between Diagnostic Group and RMET is Mediated by Trait Shame and Shame Time 2.

With respect to the SST ToM, diagnostic group significantly predicted both TOSCA-S, with a path coefficient of 10.98 (*SE* = 1.39), $p <$. 01, as well as Shame Time 2, with a path coefficient of 8.12 (*SE* = .83), $p < .01$. After controlling for diagnostic group, TOSCA-S significantly predicted SST ToM, with a path coefficient of .078 (*SE* = .04), $p = .036$, but Shame Time 2 did not significantly predict SST ToM, with a path coefficient of -.07 (*SE* = .06), $p = .26$.

The indirect effect of diagnostic group on SST ToM through trait shame was significant, with a path coefficient of .85 (Boot *SE* = .39, 95% CI = .093, 1.63), though the indirect effect of diagnostic group on SST ToM through state shame was not significant, with a path coefficient of -.56 (Boot *SE* = .53, 95% CI = -1.62, .42). The direct effect of diagnostic group on SST ToM was not significant, with a path coefficient of -1.01 (*SE* = .75), $p = .18$ (see Figure 4b).

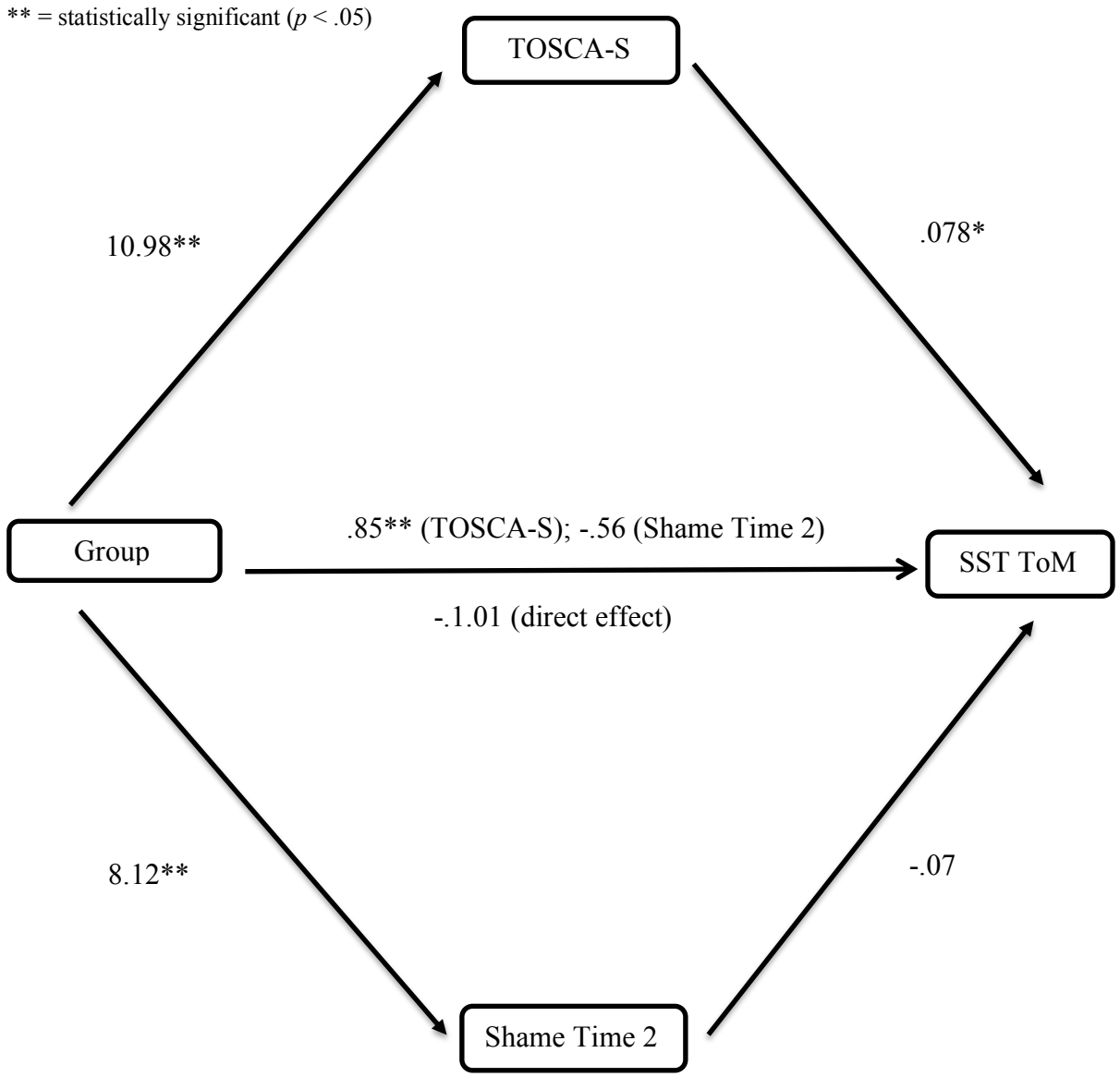


Figure 4b: Parallel Mediation Analysis to Assess Whether the Relationship between Diagnostic Group and SST ToM is Mediated by Trait Shame and Shame Time 2.

Although the indirect effect of diagnostic group through state shame was not significant for either the RMET or the SST ToM, it is important to note that the path coefficient of state shame in both analyses was negative, whereas the statistically significant path coefficient of trait shame was positive in both analyses. Therefore, the data indicate that although individuals with BPD have lower ToM scores, trait shame might suppress this relationship, whereas state shame does not.

The results from these mediation analyses suggest that trait shame and state shame have different effects on ToM abilities for individuals with BPD. I decided to evaluate the three-way interaction among diagnostic group, trait shame, and state shame on ToM, when controlling for experimental condition, in order to assess whether different levels of trait and state shame differentially impact ToM abilities in individuals with BPD. Using Model 3 of the PROCESS Macro for SPSS (Hayes, 2013), we found a significant three-way interaction among diagnostic group, trait shame, and state shame on the RMET, $B = .059$ ($SE = .028$), $t(132) = 2.09$, $p = .038$, model $R^2 = .139$. For participants low in state shame, trait shame did not moderate the relationship between diagnostic group and RMET score (see Figure 5a). However, for participants high in state shame, trait shame moderated the relationship between diagnostic group and RMET score such that for the BPD group, higher levels of trait shame predicted higher RMET scores, whereas for the non-BPD control group, higher levels of trait shame predicted lower RMET scores (see Figure 5b).

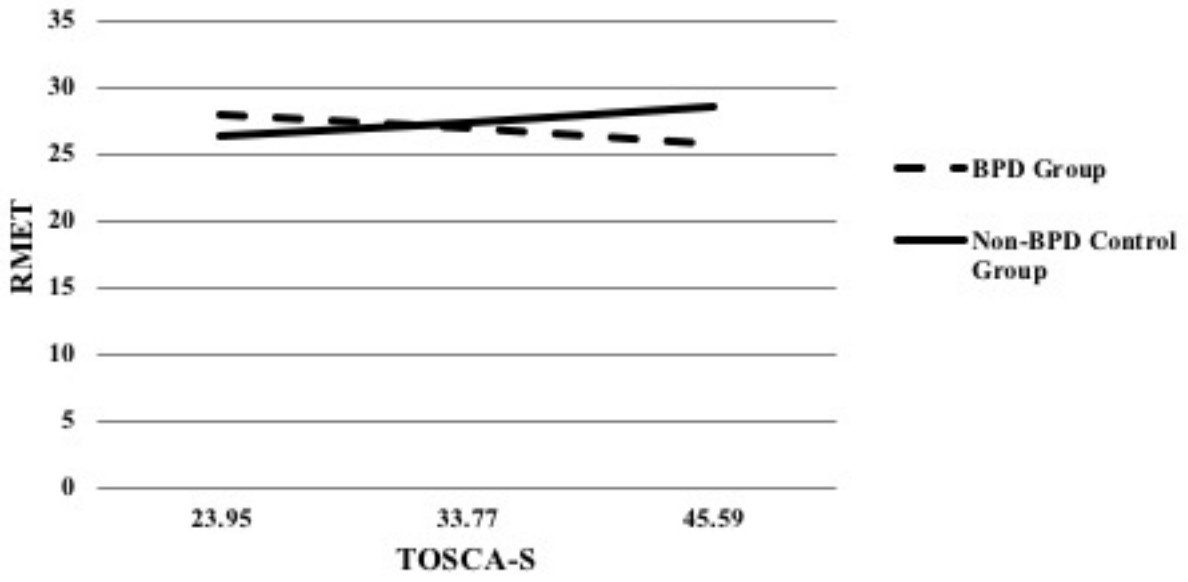


Figure 5a: Interaction between Diagnostic Group, Trait Shame, and RMET Among Participants with Low State Shame.

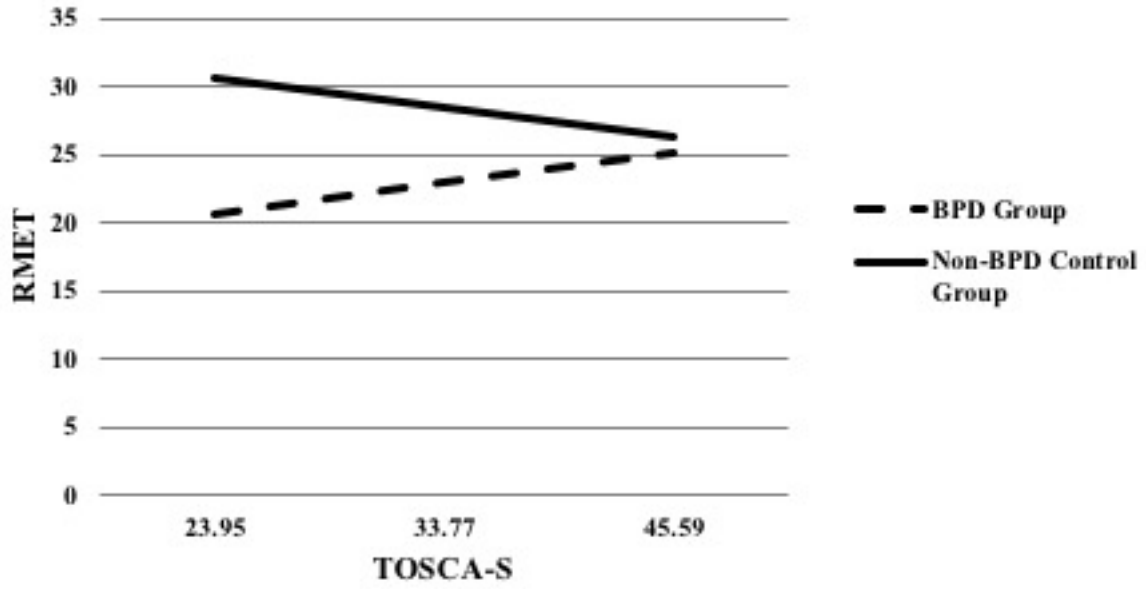


Figure 5b: Interaction between Diagnostic Group, Trait Shame, and RMET Among Participants with High State Shame.

Therefore, for participants high in state shame, higher levels of trait shame appeared to hinder ToM abilities (as measured by the RMET) for participants without BPD, but predicted

better ToM performance for participants with BPD. In fact, for individuals high in both trait and state shame, RMET scores for individuals with BPD were nearly the same as RMET scores for individuals without BPD, whereas for individuals high in state shame but low in trait shame, individuals without BPD scored higher on the RMET than did individuals with BPD. The three-way interaction among group, trait shame, and state shame on the SST ToM, controlling for experimental condition, was not significant, $B = .01$ ($SE = .02$), $t(132) = .68$, $p = .50$, model $R^2 = .07$.

CHAPTER 4

DISCUSSION

This study sought to provide causal evidence for the relationship between shame and theory of mind in individuals with BPD by experimentally manipulating individuals' mood prior to completing theory of mind (ToM) tasks. Although difficulties with ToM have been theorized to underlie the disorder's development (e.g., Bateman & Fonagy, 2003), there are mixed findings regarding ToM abilities in individuals with BPD, thereby highlighting the need for research that explores the impact of different variables on ToM abilities in this population. Although shame is not a diagnostic criterion for BPD, there is ample clinical and research support for the role that shame plays in the disorder (e.g., Crowe, 2004; Rüsch et al., 2007). As a self-conscious emotion, shame is fundamentally related to individuals' experiences and perceptions of other people, often leading individuals to engage in maladaptive behaviors in interactions with others (e.g., Rizvi & Linehan, 2005). The interpersonal consequences of the shame experience, in conjunction with the role that this emotion plays in BPD, suggest that ToM performance might be differentially impacted by experiences of shame in this population. Specifically, I predicted that state shame, as induced by a shame mood induction, would hinder ToM abilities in individuals with BPD but not in individuals without BPD. I also predicted that state sadness, which is another emotion often experienced by individuals with BPD, would not impact ToM abilities in individuals with BPD in spite of its association with the disorder, due to the nature of the specific effects of shame on interpersonal behaviors and functioning.

The data did not support Hypotheses 1a and 1b, which had predicted that the experimental condition (shame mood versus sad mood versus bored mood) would moderate the relationship between diagnostic group (BPD versus non-BPD control) and ToM score (RMET or SST ToM). The data from these analyses indicated that there was no significant interaction

between diagnostic group and experimental condition with respect to ToM. It is important to note that the experimental conditions themselves functioned differently than intended with respect to the amount of state shame induced. Manipulation check analyses showed that the amount of shame that the shame condition induced was not significantly different from the amount of shame induced by the sadness or boredom conditions; in fact, the only significant difference in the amount of shame induced by different experimental conditions was between the sadness mood induction and the boredom mood induction, in that the sadness mood induction induced significantly more shame in participants than did the boredom mood induction. However, when I evaluated whether state shame moderated the relationship between diagnostic group and ToM scores across experimental conditions, the results were again nonsignificant for both the RMET and SST ToM. This aligns with data that suggest that floor effects may have impacted the efficacy of the shame mood induction on the non-BPD control group, which might help account for the nonsignificant findings. Therefore, although the experimental conditions did not produce the intended effects on shame, state shame across experimental conditions also did not moderate the relationship between diagnostic group and ToM performance. It is possible that the data are correct, which would imply that state shame does not have a different effect on ToM abilities in individuals with BPD as compared to individuals without BPD. However, it is also possible that the lack of significant findings was due at least in part to the fact that the experimental conditions did not function as intended with respect to inducing shame, thereby attenuating the results.

The findings also did not support Hypotheses 2a and 2b, which predicted that the relationship between diagnostic group and ToM would be mediated by identity disturbance and trait shame, the effects of which would be moderated by the experimental condition. Although

diagnostic group did predict trait shame and identity disturbance, in that individuals with BPD had higher scores for both constructs, neither trait shame nor identity disturbance predicted ToM scores for either ToM outcome; similarly, the experimental condition did not moderate the relationship that either trait shame or identity disturbance had with ToM. Neither the direct nor the indirect effects of Hypotheses 2a and 2b were significant either. These results suggest that identity disturbance and trait shame might not account for a possible relationship between BPD and theory of mind. Similarly, this could also indicate that BPD does not affect theory of mind, or that the association between BPD and theory of mind is due to other unmeasured trait constructs. It is again important to note that the mood inductions did not function as intended, which could help explain the nonsignificant findings for these analyses. However, when I assessed Hypotheses 2a and 2b with state shame, rather than condition, as the moderator, the results were again nonsignificant.

Similarly, the data did not support Hypotheses 3a and 3b, which predicted that the relationship between BPD and ToM would be mediated by rejection sensitivity, the effects of which would be moderated by the experimental condition. Although BPD did predict rejection sensitivity, in that individuals with BPD had higher rejection sensitivity, rejection sensitivity did not predict ToM scores for either ToM outcome. The experimental condition did not moderate the relationship that rejection sensitivity had with either RMET or SST ToM, and neither the direct nor the indirect effects of Hypotheses 3a and 3b were significant. These results suggest that rejection sensitivity might not account for a possible relationship between BPD and theory of mind. Similarly, this could also indicate that BPD does not affect one's theory of mind abilities. As with previous hypotheses, the fact that the mood induction did not function as intended with respect to the effect on state shame is noteworthy. When I replaced experimental

condition with state shame as the moderator in the analyses for Hypotheses 3a and 3b, the results were nonsignificant with respect to the RMET, but were significant for the SST ToM. Of note, the path coefficient for the indirect effect of diagnostic group on SST ToM was positive, suggesting that although individuals with BPD performed more poorly on the SST ToM overall, their propensity for rejection sensitivity slightly buffered this relationship.

Although the data did not support any of the original hypotheses with respect to the effects of BPD and shame on theory of mind, exploratory analyses revealed that, when controlling for both experimental condition and trait shame, state shame predicted significantly lower scores on both the RMET and the SST ToM across all diagnostic groups (BPD and non-BPD control). This is in line with previous research that intense experiences of shame cause individuals to engage in negative self-evaluations that can hinder other-oriented empathic processes, which is a subconstruct within ToM (Tangney & Dearing, 2002). However, it is important to note that these analyses were only significant when holding trait shame constant, which limits the generalizability of these findings. Trait shame did not have a significant effect on either RMET or SST ToM when serving as a control variable in these analyses; however, its coefficient was positive, suggesting that state shame and trait shame might function differently with respect to ToM abilities. Given that individuals with BPD tend to have higher trait shame, and this was true of this study's sample, I decided to use these findings to re-assess the impact of shame on theory of mind in individuals with BPD. Exploratory analyses indicated that although individuals with BPD performed more poorly on both the RMET and the SST ToM, higher levels of trait shame appeared to slightly suppress this relationship when holding state shame constant. One common experience associated with shame is an increased focus on others' thoughts and reactions to oneself (e.g., Leeming & Boyle, 2013), which can serve to help prevent

an individual from continuing to engage in behaviors that are likely to elicit judgment or rejection from others (de Hooge, Breugelmans, & Zeelenberg, 2008). Therefore, it is possible that individuals with BPD who are high in trait shame are inherently more likely to pay closer attention to others' emotional and behavioral responses, and that this increased hyperawareness and focus on others' perception of them might make them more attuned to others' mental states. Thus, it is possible that this general tendency serves to strengthen ToM abilities in individuals with BPD who are more shame-prone, and that they are subsequently less affected by ways in which in-the-moment experiences of shame hinder their ability to accurately identify others' mental states.

In light of these findings, I decided to further investigate the relationship among BPD, trait shame, state shame, and ToM by conducting three-way interactions between diagnostic group, trait shame, and state shame on ToM abilities, as measured by the RMET and the SST ToM. Although the results were not significant for the SST ToM, results from the RMET showed that for individuals with BPD experiencing high levels of state shame, higher levels of trait shame predicted better ToM performance, whereas for individuals without BPD experiencing high levels of state shame, higher levels of trait shame predicted worse ToM performance. These exploratory analyses suggest that when experiencing high levels of state shame, individuals with BPD who are more shame-prone might be better at ToM tasks than individuals with BPD who are less shame-prone, whereas the opposite might be true for individuals without BPD. Although in-the-moment experiences of intense shame – which are more frequently experienced by individuals with BPD (e.g., Gratz et al., 2010) – likely inhibit ToM functioning in individuals with BPD, these findings again suggest that their propensity to experience shame might actually enhance their ability to identify and recognize others' mental

states. This could help account for the mixed research evidence and clinical experience around ToM abilities in this population, as evidence exists both for and against the notion that individuals with BPD exhibit ToM impairments (e.g., Sharp et al., 2011; Fertuck et al., 2009).

Collectively, these results might help explain the "borderline empathy" that Krohn (1974) has described, which states that individuals with BPD can demonstrate stronger empathic abilities and, at the same time, often exhibit significant impairments in interpersonal functioning. Broadly, the results demonstrated that individuals with BPD performed more poorly on ToM tasks than did individuals without BPD, and in-the-moment experiences of shame predicted worse ToM functioning among individuals both with and without BPD when controlling for trait shame. However, only individuals with BPD experienced a "buffering" effect of trait shame with respect to the effects of state shame on ToM abilities. This suggests that under certain conditions, ToM functioning in individuals with BPD might be enhanced by their proneness to experience shame, though individuals without BPD who are high in trait shame do not experience this same effect. As many individuals with BPD exhibit heightened biological and self-reported emotional vulnerability to emotional experiences, such as shame (e.g., Kuo & Linehan, 2009; Crowe et al., 2004), knowledge that these traits can enable them to better perceive others' mental states could be validating and encouraging for these individuals. Additionally, learning that these same abilities might be hindered during moments of intense shame could help individuals with BPD gain awareness around conditions under which their perceptions and understanding of others might be less accurate. However, it is important to note that the exploratory nature of these analyses indicates that these findings need to be replicated in order to provide support for their validity.

BPD is widely known as a particularly socially undesirable disorder in popular culture as well as in the clinical realm. Many therapists are hesitant to treat individuals with this disorder and experience strong negative responses to them; for example, in a survey of 1,000 randomly selected clinicians conducted by Servais and Saunders (2007), more than half of those surveyed reported that working with individuals with BPD was undesirable. The interpersonal difficulties that often characterize the disorder (e.g., Hill et al., 2008) and that are present in these individuals' personal relationships often manifest in the therapeutic relationship as well. Thus, it is possible that in-the-moment shame experiences could hinder the ability of individuals with BPD to utilize ToM with clinicians. This aligns with the theoretical underpinnings of MBT (e.g., Fonagy & Bateman, 2008), particularly because individual psychotherapy often involves the discussion of vulnerable experiences and is thus likely to evoke high-intensity emotions in patients. Knowledge of these underlying processes might help decrease clinicians' judgment towards BPD when these difficult interpersonal behaviors arise, thereby increasing treatment efficacy.

The results demonstrated that when controlling for trait shame, in-the-moment shame hindered ToM functioning for individuals both with and without BPD. I had originally predicted that the effects of state shame on ToM would be specific to individuals with BPD only. It is possible that the way in which the mood inductions functioned attenuated my results, including any potential differences between the BPD group and the non-BPD control group. Future studies would benefit from the use of a different mood induction that have been shown to effectively induce shame in individuals both with and without BPD.

As stated previously, the mood inductions did not function as had been intended, both with respect to the emotions they induced as well as with respect to the effects that the mood

inductions had on participants' ToM abilities. The shame mood induction did not induce significantly more shame in participants than did the sadness mood induction or the boredom mood induction. However, the sadness mood induction did induce significantly more sadness in participants than the shame or boredom mood inductions did. Although the results were nonsignificant, individuals with BPD in the sadness mood induction condition had higher ToM scores across both ToM tasks. This indicates the possibility that sadness, which was designed to be a "control" emotion with respect to effects on ToM, might actually facilitate ToM abilities in individuals with BPD. One possible explanation for this is that sadness might be an emotion that is more familiar to individuals with BPD. Research shows that in comparison to individuals without BPD, those with BPD experience a persistence of sadness (Reisch, Ebner-Priemer, Tschacher, Bohus, & Linehan, 2008). In other words, individuals with BPD are more likely to get "stuck" in this emotional experience than are individuals without BPD. Although there is evidence that individuals with BPD also experience persistence of anxiety, this has not been suggested for the experience of shame. Therefore, as sadness might be a more familiar emotion for individuals with BPD, it is possible that it is also a more comfortable emotion for them to sit with and, subsequently, easier to tolerate than other emotions are, particularly shame.

However, it is important to note that findings are mixed with respect to the impact of major depressive disorder (MDD), a disorder that is highly comorbid with BPD (APA, 2013), on theory of mind. A hallmark feature of MDD is extended periods of sadness, and the disorder is associated with negative schema that can affect social cognitive functioning (e.g., Beck, 1967; Epa & Dudek, 2015). Bora and Berk's (2016) meta-analysis on the impact of depression on ToM concluded that across various ToM tasks, depressed individuals performed more poorly than did healthy controls. Regarding the RMET specifically, findings are mixed regarding the relationship

between depression and ToM performance. Some have found that depression is associated with improved RMET performance; Fertuck and colleagues (2009) found that depression partially accounted for the positive relationship between BPD and RMET performance, and Harkness, Sabbagh, Jacobson, Chowdrey, and Chen (2005) found a positive relationship between dysphoria and RMET performance among college students. However, other studies have found that severe depression predicts impairments in RMET performance (Lee, Harkness, Sabbagh, & Jacobsen, 2005). The mixed nature of previous evidence, in conjunction with my findings, suggests that further research is needed on the relationship between sadness, major depressive disorder, and theory of mind in individuals with and without BPD.

This study had several limitations. The fact that the experimental conditions functioned differently than intended with respect to the emotions they induced constitutes a key limitation. The shame mood induction was designed to be the experimental condition, as state shame was a key variable in the proposed analyses. The study included two control conditions: a sadness mood induction, which was designed as an "emotion control" aimed to ensure that any possible effects of the shame induction were because of shame specifically, rather than the experience of negative emotion; and a boredom mood induction, which was intended to serve as a general control condition. As stated previously, the shame mood induction did not induce significantly more shame than either of the other two conditions did. As state shame was measured before and after the mood inductions, I was still able to substitute state shame for experimental condition in the analyses; however, it is possible that the amount of state shame participants experienced at Time 2 and, subsequently, the results of the analyses were attenuated by the lack of efficacy of the mood induction. Additionally, the fact that the only significant difference with respect to the amount of shame induced was between the sadness mood condition and the boredom mood

condition suggests that sadness might not have been the most effective "emotion control" condition to utilize. For example, this might indicate that individuals with BPD have a difficult time distinguishing between experiences of sadness and experiences of shame, which are both emotions frequently experienced by individuals with the disorder. This aligns with research that demonstrates that individuals with BPD exhibit greater difficulty distinguishing between emotions (e.g., Suvak et al., 2011). If mood inductions are used in future research in this area, it could be helpful to pilot different mood inductions, including different "control emotion" mood inductions, and to determine that the emotions evoked by different mood inductions are distinct from each other.

A second and related limitation was the use of mood inductions to prompt state emotions in participants. It is possible that the effects of shame on theory of mind might be stronger in individuals with BPD when their shame experience is prompted by a real-world interaction than when shame is prompted by an artificial mood induction. As the inductions required participants to draw upon personal memories, it is also possible that the quality of memories that participants recalled and wrote about was different and more acute for individuals with BPD, who are more likely to have experienced severe past traumatic events, such as sexual abuse (e.g., Bandelow et al., 2005; Zanarini, Frankenburg, Reich, Hennen, & Silk, 2005. However, it is important to note that the primary investigator read narratives written by all participants, and that individuals were excluded if their narrative did not appear to align with the prompt provided.

The fact that theory of mind was measured by reading, writing, and picture tasks, rather than by participants' responses to real-life interactions, constitutes a third limitation. Given that I was trying to assess whether in-the-moment experiences of shame influence the way in which people identify and comprehend others' mental states, it is highly possible that the relationship

between shame and theory of mind manifests differently in individuals with BPD when they are attempting to understand the mental states of others with whom they are presently engaging, particularly if their in-the-moment experience of shame is also in response to the same individual(s) whose mental states they are attempting to identify. In other words, it is possible that when experiencing shame, an individual with BPD might be better able to attend to the mental states of others whom the individual does not know (including characters in written stories or actors in photographs), in comparison to the mental states of someone who prompted their current feeling of shame. This highlights the importance of operationalizing and specifying which ToM abilities are being assessed.

A fourth limitation was the study's utilization of internet- and phone-based methods for the administration of all study measures, as diagnostic interviews were conducted via video conferencing (Google Hangouts or Skype) or by phone and the remainder of study tasks were completed online. The fact that diagnostic interviews were not administered in person may have made it more difficult for interviewers to effectively engage with participants, and it is possible that participants' responses to study measures were less reliable because they were administered in uncontrolled environments. However, the use of standardized diagnostic interview questions, in conjunction with the utilization of video conferencing whenever participants were willing, together maximized the likelihood that the diagnostic interviews were similar in effectiveness to in-person interviews. With respect to study measures, participants were instructed to complete study measures immediately following the diagnostic interview. Only under rare circumstances were participants permitted to complete the study measures at a later time point, and even in these cases, participants were told that they had to complete study measures within 24 hours of their diagnostic interview. The online survey platform provided time stamps for participants'

start and end times for the study surveys, thereby allowing the primary investigator to check to make sure that participants completed the measures within the instructed time frame. Additionally, it is important to emphasize that the recruitment strategies and use of online mediums enabled this study to recruit a sample of participants who live in areas that are not typically represented in research and that is diverse in terms of geographic location, socioeconomic status, race, and ethnicity, thereby increasing the generalizability of the study's findings.

This study offers tentative evidence that ToM abilities in individuals with BPD are affected by both trait and state shame. In the future, researchers may choose to modify the mood induction methodology by utilizing shame mood inductions that have been shown to effectively induce shame in individuals with and without BPD. "Cyberball," a virtual ball-tossing game used to study social inclusion and exclusion, is one potential paradigm (Williams, Cheung, & Choi, 2000), as there is ample research on its use with individuals with BPD (e.g., Staebler et al., 2011; Renneberg et al., 2012), and the paradigm is inherently interpersonal in nature because it creates the experience of social exclusion. Similar to the present study, the fact that the program is played virtually would allow future researchers to also recruit participants nationally in order to maximize generalizability. In light of the present study's floor effects with respect to shame induced in individuals without BPD, it would be beneficial for future researchers to pilot Cyberball (or whichever mood induction is utilized) before beginning the full study to ensure that it effectively induces shame in individuals both with and without BPD. In addition, other possible directions for this line of research could examine real-world examples of ways in which the experience of shame impacts ToM abilities in individuals with BPD. Ecological momentary assessment (EMA; Stone & Shiffman, 1994) is one methodology that might be particularly

useful for this purpose, as it would enable the assessment of the impact of real-life experiences of state shame on ToM abilities, including subsequent interpersonal responses to and behaviors with others who prompted feelings of shame. Such research might shed more light on specific ways in which state shame affects interpersonal relationships for individuals with BPD. The evaluation of the relationship between shame and ToM within the interpersonal situations in which they naturally arise would provide deeper levels of insight into the nature of this relationship and possibly lead to the improvement of clinical approaches to shame and shame-related interpersonal behaviors in therapy.

APPENDIX A

TEST OF SELF-CONSCIOUS AFFECT-VERSION 3, SHORT VERSION

Below are situations that people are likely to encounter in day-to-day life, followed by several common reactions to those situations.

As you read each scenario, try to imagine yourself in that situation. Then indicate how likely you would be to react in each of the ways described. We ask you to rate *all* responses because people may feel or react more than one way to the same situation, or they may react different ways at different times. For example:

A. You wake up early one Saturday morning. It is cold and rainy outside.

	not likely				very likely
a. You would telephone a friend to catch up on news.	(1)	2	3	4	5
b. You would take the extra time to read the paper.	1	2	3	4	(5)
c. You would feel disappointed that it's raining.	1	2	(3)	4	5
d. You would wonder why you woke up so early.	1	2	3	(4)	5

In the above example, I've rated *all* of the answers by circling a number. I circled "1" for answer (a) because I wouldn't want to wake up a friend very early on a Saturday morning – so it's not at all likely that I would do that. I circled a "5" for answer (b) because I almost always read the paper if I have time in the morning (very likely). I circled a "3" for answer (c) because for me it's about half and half. Sometimes I would be disappointed about the rain and sometimes I wouldn't – it would depend on what I had planned. And I circled a "4" for answer (d) because I would probably wonder why I had awakened so early.

Please do not skip any items – rate all responses.

1. You make plans to meet a friend for lunch. At five o'clock, you realize you have stood your friend up.

	not likely				very likely
a. You would think, "I'm inconsiderate."	1	2	3	4	5
b. You'd think you should make it up to your friend as soon as possible.	1	2	3	4	5
c. You would think, "My boss distracted me just before lunch."	1	2	3	4	5

2. You break something at work and then hide it.

	not likely				very likely
a. You would think, "This is making me anxious. I need to either fix it or get someone else to."	1	2	3	4	5
b. You would think about quitting.	1	2	3	4	5
c. You would think, "A lot of things aren't made very	1	2	3	4	5

well these days."

3. At work, you wait until the last minute to plan a project, and it turns out badly.

	not likely				very likely
a. You would feel incompetent.	1	2	3	4	5
b. You would think, "There are never enough hours in the day."	1	2	3	4	5
c. You would feel, "I deserve to be reprimanded for mismanaging the project."	1	2	3	4	5

4. You make a mistake a work and find out a co-worker is to blame for the error.

	not likely				very likely
a. You would think the company did not like the co-worker.	1	2	3	4	5
b. You would keep quiet and avoid the co-worker.	1	2	3	4	5
c. You would feel unhappy and eager to correct the situation.	1	2	3	4	5

5. While playing around, you throw a ball, and it hits your friend in the face.

	not likely				very likely
a. You would feel inadequate that you can't even throw a ball.	1	2	3	4	5
b. You would think maybe your friend needs more practice at catching.	1	2	3	4	5
c. You would apologize and make sure your friend feels better.	1	2	3	4	5

6. You are driving down the road, and you hit a small animal.

	not likely				very likely
a. You would think the animal shouldn't have been the road.	1	2	3	4	5
b. You would think, "I'm terrible."	1	2	3	4	5
c. You'd feel bad you hadn't been more alert while driving down the road.	1	2	3	4	5

7. You walk out of an exam thinking you did extremely well; then you find out you did poorly.

not likely very likely

a. You would think, "The instructor doesn't like me." 1 2 3 4 5
b. You would think, "I should have studied harder." 1 2 3 4 5
c. You would feel stupid. 1 2 3 4 5

8. While out with a group of friends, you make fun of a friend who's not there.

	not likely				very likely
a. You would feel small… like a rat.	1	2	3	4	5
b. You would think that perhaps that friend should have been there to defend himself/herself.	1	2	3	4	5
c. You would apologize and talk about that person's good points.	1	2	3	4	5

9. You make a big mistake on an important project at work. People were depending on you, and your boss criticizes you.

	not likely				very likely
a. You would think your boss should have been more clear about what was expected of you.	1	2	3	4	5
b. You would feel as though you want to hide.	1	2	3	4	5
c. You would think, "I should have recognized the problem and done a better job."	1	2	3	4	5

10. You are taking care of your friend's dog while she is on vacation and the dog runs away.

	not likely				very likely
a. You would think, "I am irresponsible and incompetent."	1	2	3	4	5
b. You would think your friend must not take very good care of her dog or it wouldn't have run away."	1	2	3	4	5
c. You would vow to be more careful next time.	1	2	3	4	5

11. You attend your co-worker's housewarming party, and you spill red wine on a new cream-colored carpet, but you think no one notices.

	not likely				very likely
a. You would stay late to help clean up the stain after the party.	1	2	3	4	5
b. You would wish you were anywhere but at the party.	1	2	3	4	5
c. You would wonder why your co-worker chose to serve red wine with the new light carpet.	1	2	3	4	5

APPENDIX B

STATE SHAME AND GUILT SCALE

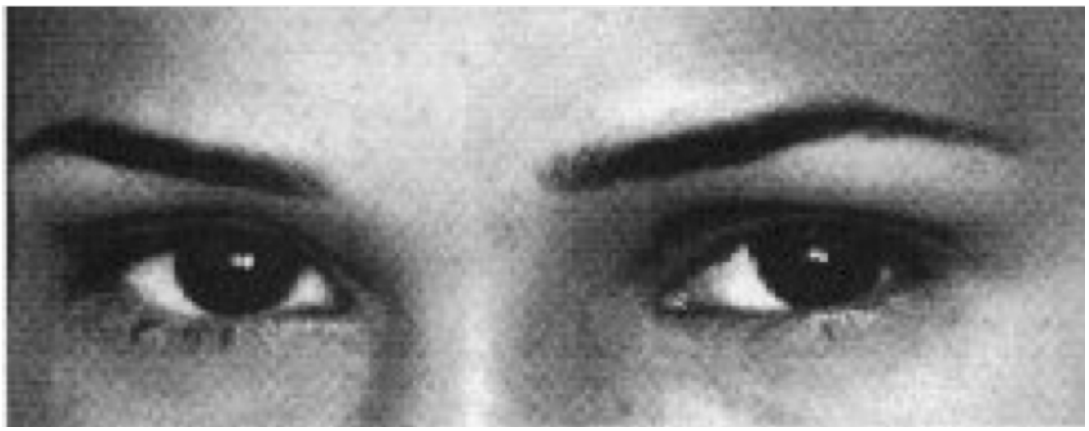
The following are some statements that may or may not describe how you are feeling *right now*. Please rate each statement using the 5-point scale below by clicking on the button next to the number that corresponds to how much you do or do not feel like the sentence describes you. Remember to rate each statement based on how you are feeling *right at this moment*.

1: Not feeling this way at all
2:
3: Feeling this way somewhat
4:
5: Feeling this way very strongly.

1. I want to sink into the floor and disappear.	1	2	3	4	5
2. I feel remorse, regret.	1	2	3	4	5
3. I feel worthwhile, valuable.	1	2	3	4	5
4. I feel small.	1	2	3	4	5
5. I feel tension about something I have done.	1	2	3	4	5
6. I feel capable, useful.	1	2	3	4	5
7. I feel like I am a bad person.	1	2	3	4	5
8. I cannot stop thinking about something bad that I have done.	1	2	3	4	5
9. I feel proud.	1	2	3	4	5
10. I feel humiliated, disgraced.	1	2	3	4	5
11. I feel like apologizing, confessing.	1	2	3	4	5
12. I feel pleased about something I have done.	1	2	3	4	5
13. I feel worthless, powerless.	1	2	3	4	5
14. I feel bad about something I have done.	1	2	3	4	5
15. I feel good about myself.	1	2	3	4	5

APPENDIX C

READING THE MIND IN THE EYES (RMET) – EXAMPLES



1) Tentative
2) Arrogant
3) Grateful
4) Sarcastic

1) Dominant
2) Guilty
3) Friendly
4) Horrified

APPENDIX D

SHORT STORY INSTRUCTIONS AND TASK

Now you are going to read a short story called *The End of Something.* The story is only a few pages, but take your time reading it. Try to get a sense of what happens and what the relationships are between the characters. After you're finished, you will be given several questions to answer.

The End of Something

In the old days Hortons Bay was a lumbering town. No one who lived in it was out of sound of the big saws in the mill by the lake. Then one year there were no more logs to make lumber, and the mill was shut down.

Ten years later there was nothing of the mill left except the broken white limestone of its foundations showing through the swamps. Nick and Marjorie rowed along the shore. They were rowing along the edge of the channel-bank in order to set up fishing lines to catch rainbow trout.

"There's our old ruin, Nick," Marjorie said.

Nick, rowing, looked at the white stone in the green trees.

"There it is," he said.

"Can you remember when it was a mill?" Marjorie asked.

"I can just remember," Nick said.

"It seems more like a castle," Marjorie said.

Nick said nothing. They rowed on out of sight of the mill, following the shore line. Then Nick cut across the bay.

"They aren't striking," he said.

"No," Marjorie said. She was intent on the rod all the time they rowed, even when she talked. She loved to fish. She loved to fish with Nick.

Close beside the boat a big trout broke the surface of the water. Nick pulled hard on one oar so the boat would turn and the bait, spinning far behind, would pass where the trout was feeding. As the trout's back came up out of the water the minnows jumped wildly. They sprinkled the surface like a handful of shot thrown into the water. Another trout broke water, eating minnows on the

other side of the boat.

"They're feeding," Marjorie said.

"But they won't strike," Nick said.

He rowed the boat around to go past both the feeding fish, then headed it for the point. Marjorie did not reel in until the boat touched the shore.

They pulled the boat up the beach and Nick lifted out a pail of live perch. The perch swam in the water pail. Nick caught three of them with his hands and cut their heads off and skinned them while Marjorie chased with her hands in the bucket, finally caught a perch, cut its head off and skinned it. Nick looked at her fish.

"You don't want to take the ventral fin out," he said. "It'll be all right for bait but it's better with the ventral fin in."

He hooked each of the skinned perch through the tail. There were two hooks attached to a leader on each rod. Then Marjorie rowed the boat out over the channel-bank, holding the line in her teeth, and looking toward Nick, who stood on the shore holding the rod and letting the line run out from the reel.

"That's about right," he called.

"Should I let it drop?" Marjorie called back, holding the line in her hand.

"Sure. Let it go." Marjorie dropped the line overboard and watched the baits go down through the water.

She came in with the boat and ran the second line out the same way. Marjorie rowed up the point a little way so she would not disturb the line. She pulled hard on the oars and the boat went up the beach. Little waves came in with it. Marjorie stepped out of the boat and Nick pulled the boat high up the beach.

"What's the matter, Nick?" Marjorie asked.

"I don't know," Nick said, getting wood for a fire.

They made a fire with driftwood. Marjorie went to the boat and brought a blanket. The evening breeze blew the smoke toward the point, so Marjorie spread the blanket out between the fire and the lake.

Marjorie sat on the blanket with her back to the fire and waited for Nick. He came over and sat down beside her on the blanket. In back of them was the close second-growth timber of the point and in front was the bay with the mouth of Hortons Creek. It was not quite dark. The fire-light went as far as the water. They could both see the two steel rods at an angle over the dark water.

The fire glinted on the reels.

Marjorie unpacked the basket of supper.

"I don't feel like eating," said Nick.

"Come on and eat, Nick."

"All right."

They ate without talking, and watched the two rods and the fire-light in the water.

"There's going to be a moon tonight," said Nick. He looked across the bay to the hills that were beginning to sharpen against the sky. Beyond the hills he knew the moon was coming up.

"I know it," Marjorie said happily.

"You know everything," Nick said.

"Oh, Nick, please cut it out! Please, please don't be that way!"

"I can't help it," Nick said. "You do. You know everything. That's the trouble. You know you do."

Marjorie did not say anything.

"I've taught you everything. You know you do. What don't you know, anyway?"

"Oh, shut up," Marjorie said. "There comes the moon."

They sat on the blanket without touching each other and watched the moon rise.

"You don't have to talk silly," Marjorie said. "What's really the matter?"

"I don't know."

"Of course you know."

"No I don't."

"Go on and say it."

Nick looked on at the moon, coming up over the hills.

"It isn't fun any more."

He was afraid to look at Marjorie. Then he looked at her. She sat there with her back toward him. He looked at her back. "It isn't fun any more. Not any of it."

She didn't say anything. He went on. "I feel as though everything was gone to hell inside of me. I don't know, Marge. I don't know what to say."

He looked on at her back.

"Isn't love any fun?" Marjorie said.

"No," Nick said. Marjorie stood up. Nick sat there, his head in his hands.

"I'm going to take the boat," Marjorie called to him. "You can walk back around the point."

"All right," Nick said. "I'll push the boat off for you."

"You don't need to," she said. She was afloat in the boat on the water with the moonlight on it. Nick went back and lay down with his face in the blanket by the fire. He could hear Marjorie rowing on the water.

He lay there for a long time. He lay there while he heard Bill come into the clearing walking around through the woods. He felt Bill coming up to the fire. Bill didn't touch him, either.

"Did she go all right?" Bill said.

"Yes," Nick said, lying, his face on the blanket.

"Have a scene?"

"No, there wasn't any scene."

"How do you feel?"

"Oh, go away, Bill! Go away for a while."

Bill selected a sandwich from the lunch basket and walked over to have a look at the rods.

APPENDIX E

SHORT STORY TASK QUESTIONS

Please answer the following questions about the story. For most of the questions, there are no right or wrong answers and the questions can be answered with short responses. We're also interested in what you believe to be the character's thoughts, feelings and intentions when it applies to the question.

1) What do Nick and Marjorie observe on the shoreline as they are rowing to the point to set their fishing lines?
2) What does Nick mean when he says, "They aren't striking?"
3) Why does Nick say to Marjorie, "You know everything"?
4) Why does Marjorie reply, "Oh Nick, please cut it out! Please, please don't be that way!"?
5) Why is Nick afraid to look at Marjorie?
6) What does Nick mean when he says, "It isn't fun anymore"?
7) Why does Marjorie sit with her back toward Nick when she asks, "Isn't love any fun?"?
8) Why does Marjorie take the boat and leave and what is she feeling at that moment?
9) Who is Bill and what does he reveal when he asks Nick, "Did she go alright? … Have a scene?"?
10) What is Nick feeling when he says, "Oh, go away, Bill! Go away for a while"?
11) The story is called "The End of Something." What is the title referring to?

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