5-2013

Does Emotion Invalidation Cause Emotion Dysregulation? Evidence from a Healthy Sample of College Students and Implications for the Development of Borderline Personality Disorder

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DOES EMOTION INVALIDATION CAUSE EMOTION DYSREGULATION? EVIDENCE FROM A HEALTHY SAMPLE OF COLLEGE STUDENTS AND IMPLICATIONS FOR THE DEVELOPMENT OF BORDERLINE PERSONALITY DISORDER

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A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Arts in Psychology

By

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The College of New Jersey
Bachelor of Arts in Psychology, 2011

May 2013
University of Arkansas

Abstract

Linehan's Biosocial theory is a widely accepted model of the development of borderline personality disorder (BPD). However, the tenet that experiences of invalidation causally influence the development of the emotion dysregulation that characterizes BPD has been subject to relatively little empirical attention. The purpose of this study thus was to experimentally investigate the effects of validation and invalidation on indices of emotion dysregulation including self-invalidation, distress tolerance, and social problem solving. The current study used a laboratory-based emotion induction procedure in which ninety college students participated in validating or invalidating conversations about emotional events with a peer confederate. Contrary to expectation, invalidated participants did not evidence higher self-invalidation, lower distress tolerance, or impaired social problem solving compared to validated participants. Exploratory analyses indicated that higher self-invalidation prior to the manipulation was associated with higher self-reported emotion dysregulation, internalized self-criticism, rejection sensitivity, and negative affect, as well as with lower distress tolerance. Additionally, invalidated participants provided a marginally greater number of negative responses when asked to think of ways to solve ambiguous social problems and reported experiencing marginally more distress during a distress tolerance task compared to participants who were validated. Implications and directions for further research are discussed.

This thesis is approved for recommendation
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10). She describes the severity of this vulnerability as akin to having no "psychological skin," similar to the lack of a physical skin in third-degree burn patients. This heightened emotionality and propensity toward negative affectivity creates substantial challenges regulating responses to incoming environmental information in individuals with this predisposition. At the time Linehan's theory was published, however, research on the biology of psychological disorders was extremely limited (Crowell, Beauchaine, & Linehan, 2009), and thus the exact nature of this proposed biological mechanism was mostly unspecified. More current research has attempted to clarify the nature of emotional vulnerability with mixed success. In particular, self-report studies have found that BPD is associated with greater affect intensity, but studies using physiological indices of emotional responding often did not support predicted differences between participants with and without BPD (see Rosenthal et al., 2008 for a review).

Invalidating environments are described as those "in which communication of private experiences is met by erratic, inappropriate, and extreme responses" (Linehan, 1993, p. 49). In invalidating environments, displays of negative affect are often punished and emotional experiences are typically trivialized or disregarded. As Linehan (1993) explains, invalidation ultimately communicates the message that the individual's perception of his or her emotions is wrong. People who are invalidated thus develop an inability to trust their own emotional and cognitive responses as accurate representations of their life experiences, and begin to check the environment for cues as to the appropriate way to respond. She further hypothesizes that children who grow up in invalidating environments learn to invalidate themselves by the time that they reach adulthood. Substantial research supports the association between invalidating childhood environments, marked by abuse or low parental care, and BPD (Herman, Perry, & van der Kolk, 1989; Nickell, Waudby, & Trull, 2002; Watson, Chilton, Fairchild, & Whewell, 2006; Zanarini

et al., 2000); however, research on invalidation and self-invalidation as mediating mechanisms has remained virtually nonexistent.

In sum, Biosocial theory maintains that both emotional vulnerability and invalidation are causal factors that lead to BPD as a chronic manifestation of difficulties regulating emotions. The paucity of research employing experimental methods to further understand the development of this disorder is thus surprising. Although Linehan's Biosocial theory suggests that both emotional vulnerability and invalidation are necessary factors in the development of the emotion dysregulation evidenced in BPD, others have suggested that invalidation can cause emotion dysregulation even among those who are born with low levels of biological vulnerability (Koerner, 2012; Leahy, 2005). This is consistent with Baker and Fenning's (2011) claim that while biological factors are important predictors of individuals' abilities to manage emotions, most researchers would agree that emotional development is "heavily socialized" (p. 413). Given that Biosocial theory asserts emotional vulnerability as a biological factor (and thus one that cannot be manipulated experimentally), manipulation of invalidation is a promising alternative way to begin to test one tenet of the theory.

Regulation of Emotions

Research on the construct of emotion regulation spans across many disciplines within psychology and is continuing to expand rapidly (see Gross, 2007 for a review). As the literature has expanded, definitional issues over exactly what constitutes emotion regulation have arisen. Although it is beyond the scope of this paper to address the intricacies of these debates, it is important to give some attention to how emotion regulation can be conceptualized. On the broadest level, emotion regulation is the process (or more likely, the processes) by which people manage their own emotions (Gross, 1998; Koole, 2009). Emotion regulation can dampen,

intensify, or maintain emotions, and likely involves both automatic and controlled processes (Gross & Thompson, 2006; Gyurak, Gross, & Etkin, 2011; Koole, 2009; Werner & Gross, 2009). Additionally, most theories of emotion regulation agree that all emotions are regulated regardless of valence (Gross & Thompson, 2006), although the vast majority of research has focused on the regulation of negative emotions. Examples of emotion regulation strategies include expressive suppression, the tendency to hide emotions, and cognitive reappraisal, the tendency to reevaluate and reassign meaning to emotions (Bonanno, Papa, O'Neill, Westphal, & Coifman, 2004; Butler et al., 2003; Gross & John, 2003; Richards & Gross, 2000; Richards, 2004).

Emotion Dysregulation and Borderline Personality Disorder

The process by which emotions are regulated can be conceptualized as having both adaptive and maladaptive aspects (Putnam & Silk, 2005). For example, in excess of 75% of the diagnostic categories in the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision* (DSM-IV-TR; APA, 2000) are characterized by problems with emotions or emotion regulation (Bear, Peters, Eisenlohr-Moul, Gieger, & Sauer, 2012; Werner & Gross, 2009). The term emotion dysregulation has been coined to refer generally to problems in the regulation of emotions; however, no definition has been universally accepted (Putnam & Silk, 2005). I will utilize a definition proposed by Gratz and Roemer (2004) in which emotion dysregulation is:

> "a multidimensional construct involving the following: (a) lack of awareness, understanding, and acceptance of emotions; (b) lack of access to adaptive strategies for modulating the intensity and/or duration of emotional responses; (c) an unwillingness to experience emotional distress as part of pursuing desired goals; and (d) the inability to engage in goal-directed behaviors when experiencing distress" (p. 43).

This definition allows for assessment of the functionality of an individual's reactions to his or her emotions and distinguishes emotion dysregulation from emotional intensity or reactivity (Gratz, Rosenthal, Tull, Lejuez, & Gunderson, 2006).

As mentioned previously, emotion dysregulation is regarded as the overarching cause of BPD symptoms. Emotion dysregulation has been thought to be influenced by both biology and environmental factors, and to manifest itself in variations in affect, behavioral responses, and even physiological processes. Manifestations of dysregulation in people with BPD include impulsive behavior and problems with anger, as well as instability of emotions, interpersonal relationships, and self-image (APA, 2000; Koenigsberg et al., 2002). Linehan also specified that manifestations of emotion dysregulation include poor control over one's emotional state, and inability to both refrain from maladaptive behavior and engage in goal-directed behavior when highly emotionally aroused. As such, distress-tolerance, self-invalidation, and maladaptive social problem solving strategies have been identified as emotion dysregulation indices that are particularly relevant for BPD.

Distress-tolerance is conceptualized as both an individual difference variable and a state measure of a person's willingness to experience emotional distress as a part of pursuing desired goals (McHugh et al., 2011). Impaired distress tolerance is thus a measure of dysregulation that is consistent with Gratz and Roemer's (2004) conceptualization that one part of emotion dysregulation is disinclination to experience emotional distress, even when necessary in order to pursue desired goals. Theory suggests that distress tolerance is impaired in women who are diagnosed with BPD, and that a borderline crisis often arises when an individual is either unable to tolerate distress or to escape the stressing situation (Linehan, 1993). Initial empirical evidence supports this relation (Bornovalova et al., 2008; Gratz et al., 2006), although one study of

outpatient men and women with BPD symptoms found no relationship between distress tolerance and BPD symptom severity (Iverson, Follette, Pistorello, & Fruzzetti, 2012). The majority of participants (72.5%) in the study, however, completed the distress-tolerance task, suggesting a ceiling effect may have limited the potential to assess this relation. Deficits in distress tolerance have also been found in self-injuring populations (Nock & Mendes, 2008); self-injury is a behavior that often exists outside of BPD, however is one diagnostic criterion for the disorder (APA, 2000).

Self-invalidation is another construct theoretically indicative of emotion dysregulation, and refers to the tendency of a person to invalidate his or her own emotional experiences. This construct is similar in nature to emotional non-acceptance, which involves labeling certain emotions as bad or wrong (Gratz, Bornovalova, Delany-Brumsey, Nick, & Lejuez, 2007), and thus is another piece of emotion dysregulation as described by Gratz and Roemer (2004). Self-invalidation is also likely related to instability of self-concept, as external influences will often overshadow an individual's gut responses when self-invalidation is employed as a management strategy for dealing with emotions. Self-invalidation may cause people with BPD to rely on environmental cues about how to think, feel, or act because this learned tendency to distrust their own emotions (Linehan, 1993). Despite the negative implications of this construct, self-invalidation may allow an individual to avoid dealing with his or her own emotions, thus functioning as a regulatory mechanism. This concept has been virtually unexplored using empirical studies, although self-invalidation is commonly addressed in treatment of BPD (Linehan et al., 2002; Swales, Heard, & Williams, 2000).

A final potential indicator of emotion dysregulation thought to be relevant to BPD is a deficit in social problem solving skills. Adequate social problem solving abilities are an essential

part of adaptive functioning that when underdeveloped can lead to dysfunction in life more generally by increasing stress, as well as the potential to engage in stress-relieving behaviors that further impair social problem solving abilities such as substance use (McMurran, Egan, & Duggan, 2005). This construct is a potential manifestation of emotion dysregulation as the inability to engage in goal-directed behaviors when distressed (Gratz & Roemer, 2004), and is important to examine given that many of the features associated with maladjustment in BPD occur in the context of interpersonal difficulties and conflict (Brodsky, Groves, Oquendo, Mann, & Stanley, 2006; Lejuez et al., 2003; Selby, Braithwaite, Joiner, & Fincham, 2008). One explanation for difficulties in social problem solving is offered by Loewenstein and colleagues, who have found that people tend to project their current feelings onto their predictions of their own future feelings and behaviors (Loewenstein, O'Donoghue, & Rabin, 2000; Loewenstein, Prelec, & Shatto, 1996). In the case of individuals with BPD, this means that since they are likely to be in a heightened negative and self-doubting state, they are also likely to see social problems that arise as more negative, with less plausible solutions due to lower perceived self-efficacy. Empirical evidence supports the notion that people with BPD evidence social problem solving deficits (Kremers, Spinhoven, Van der Does, & Van Dyck, 2006; Maurex et al., 2010; McMurran, Duggan, Christopher, & Huband, 2007) and social problem solving skills training is incorporated as a part of treatment for BPD (Linehan, 1993).

Invalidation and Borderline Personality Disorder

According to Biosocial theory, an invalidating environment is one important cause of emotion dysregulation (Gunderson & Zanarini, 1989; Linehan, 1993). Invalidation is typically conceptualized as perpetrated by a child's caregivers (Linehan, 1993). Developmental research has supported the notion that parenting practices have implications for children's development of

emotion regulation (Eisenberg, Cumberland & Spinrad, 1998; Morris, Silk, Steinberg, Myers, & Robinson, 2007). For example, Morris and colleagues (2007) suggest that parents vary in their goals regarding socialization of emotion. Some parents believe that emotions are bad and should not be expressed, while others feel that understanding and feeling one's emotions is important; each of these parental beliefs has implications for the lessons that children will learn about emotions from their parents (Gottman, Katz, & Hooven, 1996; Morris et al., 2007).

Experiences that are comparable to those that characterize an invalidating environment (i.e., childhood abuse, negative parenting) have received much more attention than pure focus on invalidation. Linehan (1993) conceptualized abuse as an extreme form of invalidation often experienced by women who develop BPD. The connection between childhood abuse and BPD has been well-established (Murray, 1993; Ogata et al., 1990; Watson, Chilton, Fairchild, & Whewell, 2006). Additional studies have provided evidence that people with BPD can be distinguished from other diagnostic groups by considering repeated abusive experiences and multiple maltreatment (Herman et al., 1989; Ogata et al., 1990; Zanarini et al., 1997). Studies of parenting behaviors similar to invalidation have examined the role of parental denial of feelings and parental criticism. Zanarini and colleagues (1997) found high rates of parental denial of feelings during childhood in retrospective self-reports of inpatients with BPD. Cheavens and colleagues (2005) also found significant correlations between parental criticism and BPD features in a sample of college students.

Although experimental research on validation and invalidation is scarce, these constructs have been examined in the therapy and nursing literatures (Becker & Zayfert, 2001; Safran & Muran, 1996; Toseland et al., 1997). For example, Linton, Boersma, Vangronsveld, and Fruzzetti (2012) experimentally manipulated validation during painful activity in a chronic pain

population. The researchers found that validation, compared to invalidation, was associated with significantly more positive affect and adherence to the study protocol. Correlational research based on retrospective self-reports has also found invalidation to be associated with constructs relevant to BPD including negative core beliefs in women with eating disorders (Ford, Waller, & Mountford, 2010). Another study found that invalidation mediates the relation between borderline features and level of dysfunction in current romantic relationships (Selby et al., 2008).

The aforementioned research provides initial support for the theorized relation between invalidating environment and BPD symptomatology or diagnosis. However, conclusions that can be made from these studies are limited. Although these variables likely capture aspects of Linehan's concept of invalidation, it is possible that the constructs are not analogous. Additionally, these studies relied solely on retrospective self-report and thus are unable to contribute fully to an understanding of etiology in BPD.

Modeling an Invalidating Environment in the Laboratory Setting

Despite the fact that Linehan's theory has been widely accepted, few studies have experimentally tested the underpinnings of this conceptualization of borderline personality disorder. The tenet that there is likely a biological component that increases the likelihood of a specific individual later meeting criteria for a diagnosis of BPD has initial empirical support (Donegan et al., 2003; Herpertz et al., 2001). However, very little research has directly investigated causal mechanisms in the development of emotion dysregulation. In particular, the pivotal role of an invalidating environment proposed in Linehan's (1993) theory has been subject to relatively little empirical attention.

To the author's knowledge, only two published studies (Chapman, Walters, & Dixon-Gordon, in press; Woodberry, Gallo, & Nock, 2008) and one unpublished dissertation (Reeves,

2007) have attempted to model Linehan's concept of invalidation in a laboratory environment. Woodberry and colleagues (2008) aimed to test the idea that individuals with BPD have biologically-based emotional vulnerabilities which lead to more intense and rapid responses to invalidation. Participants in this study were identified either as having high levels of BPD symptoms or as healthy controls. All participants completed a frustrating anagram task during which they were either verbally validated ("Most people find this set of anagrams really frustrating." spoken in a warm tone) or invalidated ("There's *no* need to get really frustrated. They're *just* anagrams." spoken in a puzzled tone) by the experimenter (p. 174). Although the researchers found preliminary support for differing self-reported emotional valence after the manipulation, the BPD features group showed no indication of hyperarousal, as assessed through self-report and skin conductance, prior to or after experiencing validation or invalidation. A second laboratory study, reported in a dissertation by Reeves (2007), grouped participants based on baseline emotional vulnerability (high or low), consistent with Linehan's proposition that high emotional vulnerability is what causes individuals to be particularly susceptible to an invalidating environment. Reeves (2007) had participants view 15 negatively valenced images taken from the International Affective Picture System (IAPS; Lang, Bradley, & Cuthbert, 1999), after which they were asked how they felt about the set of pictures they just saw. Participants rated three sets of five images on a 5-point Likert scale ranging from 1 (*not upset at all*) to 5 (*extremely upset*). Following the rating, participants were given a computerized validating ("You pressed 3. That makes sense. That reaction was right.") or invalidating ("You pressed 3. That doesn't make sense. That reaction was wrong.") response (p. 28). Participants subsequently participated in a computerized distress-tolerance task. Reeves found no statistically significant

effects of invalidation on people in the emotionally vulnerable group, including on measures of skin conductance, vagal tone, and distress tolerance.

A more recent laboratory study by Chapman and colleagues (in press) utilized a recruiting procedure similar to Woodberry and colleagues (2008) paper, but further emphasized the social component of the experimental manipulation. They recruited individuals considered to have high BPD features and low BPD features and randomly assigned them to experience negative feedback either on their writing (negative evaluation/academic) or about a personality profile the person wrote that included their favorite books and movies, items they would take to a deserted island, and five adjectives to describe themselves (negative evaluation/social). The authors found that high-BPD individuals evidenced greater reactivity (i.e., greater increases in negative emotion from pre- to post-manipulation) in response to the social stressor compared to the academic stressor, while low-BPD control participants evidenced the opposite pattern.

An additional study that did not manipulate invalidation but that aimed to test Linehan's Biosocial theory used structural equation modeling and a series of self-report questionnaires (Reeves, James, Pizzarello, & Taylor, 2010). Invalidation was measured using three subscales (Distress Reactions, Punitive Reactions, and Minimalization Reactions) from the Socialization of Emotion Scale (SES; Krause, Mendelson, & Lynch, 2003) thought to correspond to Linehan's conceptualization of invalidation. This measure assessed memories of parental responses to a subject's emotional displays during childhood. Reeves and colleagues found that a history of emotional invalidation was not related to BPD symptoms reported at the time of the study and that variance in BPD symptoms explained using structural equation modeling was not significantly affected when invalidation was removed from the model.

Although the extant research has failed to support Linehan's proposed relationship between invalidation and indices of emotion dysregulation related to BPD in more investigations than not, much of this research is methodologically problematic for several reasons. First, invalidation has yet to be manipulated in a social context involving the sharing of emotional experiences. One study used computerized feedback, while another gave spontaneous experimenter feedback over an intercom without the individual herself sharing an emotion. These models, thus, are missing the emphasis on interpersonal context which is central to invalidation as Linehan describes it. This is an important limitation because potential poignancy of the invalidation was likely limited as a result. As such, an alternative explanation for the lack of between-group differences found in the previous studies is that the invalidation manipulation itself was unsuccessful (i.e., too weak to elicit an emotional response). More recent research by Chapman and colleagues (in press) directly compared two types of negative feedback, academic and social, among individuals with high and low levels of BPD features and found that individuals with high BPD features evidenced significantly greater negative affect in response to the negative social but not academic feedback. This research gives further credence to the necessity of investigating invalidation in a social context. However, this study still lacked an emphasis on the sharing of an emotional experience. A second potential problem is that previous research has placed greater emphasis on physiological responses as outcome variables and has neglected to focus more attention on the potential behavioral manifestations of emotion dysregulation that Linehan describes. Although including physiological data is an important contribution to the literature in this area, it is possible that one instance of invalidation in the laboratory setting might not induce differing physiological changes. Additionally, if the manipulation was unsuccessful at eliciting an emotional response from both control group and experimental participants (i.e., those with

borderline features or high on emotional vulnerability), this provides another reason that between group differences may not have been found. In order to translate the emotional poignancy of invalidation from the real-world environment to an artificial laboratory setting, a stronger induction of emotion needs to be used. Third, the laboratory studies manipulated invalidation relative to a laboratory task. It is possible that participants were not as invested in the task as they would be in situations that have a greater perceived impact on their lives, and thus invalidation of the participant's emotional response in regard to that task may not be particularly effective. Even the finding that emotionally vulnerable people did not respond to invalidation is hard to interpret because of the small sample size in this group ($N = 11$) from past research. Finally, many of the participants completed the distress tolerance task used in past research, suggesting that a ceiling effect may have limited findings since time to discontinuation was used as the dependent variable.

Current Study

The present study examined the associations between validation or invalidation of a shared emotional experience and several indices of emotion dysregulation, including distress tolerance, self-invalidation, and social problem solving. A healthy sample was used in this experimental design to increase the likelihood that study results were due to the experimental manipulation. As such, potential participants completed several brief pre-screening questionnaires via online survey data collection to be considered for participation. Selected participants were invited to the laboratory to participate in the full study. During the laboratory session, participants first completed individual difference measures, followed by an initial measure of self-invalidation. Next, participants underwent the experimental manipulation, in which their feelings about an emotional event were either validated or invalidated by a partner,

as determined by random assignment. Participants then completed the second self-invalidation measure to assess changes in self-invalidation due to the manipulation. After the manipulation, participants also completed a distress tolerance task and a social problem solving task. Participants were then debriefed. Participants in the invalidating condition were assured that the situation they shared and their emotions surrounding it were completely acceptable. All participants were provided the opportunity to watch 10 minutes of a humorous film prior to leaving the laboratory to help them increase positive and decrease negative affect.

Laboratory studies designed to address how invalidation relates to the behavioral outcomes theorized to be present in people with BPD are an important next step in attempting to empirically address individual tenets of Linehan's theory that have stood nearly two decades untested. This study aimed to improve upon past work in several ways. First, self-invalidation, an important component of the emotion dysregulation process described in Biosocial theory but often not included in research, was assessed as an outcome measure. Second, this study used a behavioral measure of social problem solving (Nock, 2006) in order to elicit strategies that are context-dependent and might be more easily influenced using a laboratory emotion manipulation compared to trait measures. This is an important distinction, given that some researchers (Dixon-Gordon, Chapman, Lovasz, & Walters, 2011) suggest that deficits in social problem solving might be dependent on emotional context and might be more thoroughly assessed using a behavioral measure. Finally, this study experimentally manipulated invalidation in a social context. Invalidation was operationalized as social feedback that indicated, implicitly or explicitly, the non-acceptance of another person's expressed emotional experience. Non-acceptance may be expressed through body language or verbalizations, and may suggest to the person that they should augment their emotional responses and behaviors. Non-acceptance may

also be expressed by ignoring a person while they are sharing an experience without actually verbalizing opposition. Constructing a more narrow definition of invalidation, while remaining consistent with Linehan's (1993) theory, allowed for an experimental test of the effects of invalidation on emotion dysregulation, a relation that is central to the Biosocial model of BPD. Finally, the current study also attempted to disentangle the influence of emotional vulnerability and invalidation by examining invalidation separately. This allows research to move out of the realm of psychopathology in order to examine processes as they develop. Investigating causality using individuals with BPD would be problematic given that the causal processes have occurred and symptoms have already developed. Using healthy subjects can provide a cleaner slate to examine whether invalidation can indeed cause state-level emotion dysregulation, an important aspect of Biosocial theory that has yet to receive necessary empirical support.

Study Hypotheses

The following hypotheses were tested:

1. Participants in the invalidating condition will demonstrate increased self-invalidation after the experimental manipulation, while participants in the validating condition will either decrease or maintain their self-invalidation scores from prior to the manipulation.

2. Participants in the invalidating condition will score higher on the measure of self-invalidation after the manipulation compared to participants in the validating condition, as higher scores are indicative of increased self-invalidation.

3. Participants in the validating condition will persist longer (i.e., attempt to match more cards prior to quitting) on the distress tolerance task than participants in the invalidating condition.

4. Participants in the invalidating condition will evidence greater impairment on a measure of social problem solving compared to participants in the validating condition. Specifically, participants in the invalidating condition will generate fewer overall solutions and report lower ability to enact a provided model response (self-efficacy).

Method

Participants

A total of 236 students (163 women) ranging in age from 18 to 24 years old ($M = 19.14$, $SD = 1.33$) from the psychology student subject pool completed pre-screening measures to determine eligibility for the present investigation. Individuals who self-reported high current levels of distress as determined by a score that was 1.5 standard deviations above the mean for their gender on the Brief Symptom Inventory ($M = 1.67$ for males, $M = 1.34$ for females), past or current diagnosis of any personality disorder, social phobia, generalized anxiety disorder, current use of psychotropic medication, and/or having received psychological counseling in the past 6 months were excluded from participation beyond the pre-screening. Of 236 participants who completed the pre-screening, 187 (123 women) were eligible for participation in the laboratory study and 114 (77 women) ultimately completed the laboratory session and received course credits for their participation. After study completion, all cases were coded by another research assistant, blind to participant condition, to assess if the confederate successfully administered the scripted validating or invalidating feedback. Thirteen participants' data were excluded from analyses due to lack of script adherence, as determined by these condition checks. An additional 11 were excluded from final hypothesis testing for other reasons (5 due to questionable session data, 4 due to technological difficulties, and 2 were practice participants used for training research assistants). Excluded participants were similar to those ultimately included in

hypothesis testing in that they were primarily female (70%), primarily Caucasian (63%), and approximately 19 years of age on average ($M = 19.04$, $SD = 1.00$).

Pre-Study Measures

   Personality inventory. Participants completed the Big Five Inventory (BFI; John, Donohue, & Kentle, 1991) as a measure of personality traits, which was only used to aid in the experimental manipulation. The BFI is a 44-item questionnaire in which participants rate statements about how they see themselves on a 5-point Likert scale from *disagree strongly* to *agree strongly.* The BFI provides ratings of extraversion, agreeableness, conscientiousness, neuroticism, and openness. Participants and confederates together received personality feedback based on all dimensions except neuroticism, which was accurate for the participant, to create an expectancy of similarity between the participant and the confederate.

   Self-reported health history. Participants completed a self-report measure to assess for previous psychiatric diagnoses. The checklist contained major psychiatric diagnoses, as well as an "other" option where participants could specify any previous mental health problems not on the list. A similar number of general health concerns (e.g., hypertension, diabetes, cancer) were also included on the list so that the measure appeared to be a measure of general health history. Additional questions inquired if the participant was currently prescribed medication for treatment of a psychiatric problem and if the participant had received psychological counseling in the past 6 months.

   Current psychological distress. Participants completed the Brief Symptom Inventory (BSI; Derogatis, 1993) in order to assess for general level of psychological distress. The BSI is a 53-item self-report symptom inventory that was derived from the Symptom Checklist-90-Revised (SCL-90-R; Derogatis, 1994). Symptoms are rated on a 5-point Likert scale ranging

from *not at all* to *extremely*. It measures nine symptom dimensions and 3 global indices of distress, including the Global Severity Index (GSI), which was used for this study. GSI raw scores are obtained by summing all test items and dividing by the total number of items. The BSI is a commonly used psychiatric screening measure and correlates highly with the SCL-R-90.

Demographics. Participants completed a general demographics questionnaire to assess biological sex, age, race/ethnicity, major, year in school, and parental socioeconomic status.

Pre-Experiment Individual Difference Measures

The following measures were used to check that participant characteristics that would be expected to impact the effect of the experimental manipulation were equally distributed between the randomly assigned groups.

Baseline emotion dysregulation. Participants completed the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004), a 36-item self-report questionnaire that is used to assess difficulties regulating emotions. This questionnaire measures emotion regulation across six domains and focuses on responses to emotions during times of distress. Participants rate the items on a 5-point Likert scale from *almost never* to *almost always*, with higher scores indicating greater difficulties in emotion regulation. The authors report high internal consistency, high test-retest reliability for the overall DERS score (Gratz & Roemer, 2004). The internal consistency in this sample was good ($\alpha = 0.88$).

Self-criticism. Participants completed the Levels of Self-Criticism Scale (LOSC; Thompson & Zuroff, 2004), a 22-item questionnaire that measures both negative views of the self in comparison to others (comparative self-criticism) and negative views of the self in comparison to internal personal standards (internalized self-criticism). Participants rated how well each of the 22 statements describe them using a 7-point Likert scale ranging from *not at all*

to *very well*. Responses are summed and higher scores are reflective of greater self-criticism. The authors report good internal reliability in adult non-clinical populations and good concurrent validity, which has been replicated in other research (Gilbert, Baldwin, Irons, Baccus, & Palmer, 2006; Irons, Gilbert, Baldwin, Baccus, & Palmer, 2006). The internal consistency in this sample was acceptable for comparative self-criticism ($\alpha = 0.69$) and good for internalized self-criticism ($\alpha = 0.89$).

Distress tolerance. Participants completed the Distress Tolerance Scale (DTS; Simons & Gaher, 2005), a 15-item self-report measure on which participants rate the extent to which they believe they can endure distressing emotional states on a 5-point Likert-scale from *strongly agree* to *strongly disagree.* Higher scores on the DTS are indicative of higher tolerance for emotional distress. The total DTS score was used to obtain an index of overall perceived distress tolerance, as has been done in past research (Anestis, Selby, Fink, & Joiner, 2007; Vujanovic, Marshall-Berenz, & Zvolensky, 2011), prior to the emotion induction. The authors report strong internal consistency, as well as good convergent and divergent validity. Additional research has reported strong psychometric characteristics (Dennhardt & Murphy, 2011; Iverson et al., 2012). The internal consistency in this sample was good ($\alpha = 0.88$).

Rejection sensitivity. Participants completed the Rejection Sensitivity Questionnaire (RSQ; Downey & Feldman, 1996), an 18-item questionnaire that involves hypothetical social situations in which rejection is possible. Example scenarios include, "You ask your friend to do you a big favor" and "You ask your parents to come to an occasion important to you." Participants rate their level of concern or anxiety experienced in each situation on a 6-point Likert scale from *very unconcerned* to *very concerned*, as well as the perceived likelihood that others would act in a favorable manner on a 6-point Likert scale from *very unlikely* to *very likely*.

Scores on the measure are obtained by reversing the likelihood of a favorable outcome rating, multiplying these scores by the ratings of concern/anxiety, and then averaging across all 18 items on the survey. The RSQ was developed for use with college students and has shown strong convergent, divergent, and predictive validity with this population (Downey & Feldman, 1996), as well as strong internal consistency (Selby, Ward, & Joiner, 2010). The internal consistency in this sample was good ($\alpha = 0.86$).

Borderline features. Participants completed the McLean Screening Instrument for borderline personality disorder (MSI-BPD; Zanarini et al., 2003), a 10-item self-report questionnaire that assesses for the presence of BPD symptoms based upon DSM-IV-TR criteria. Items are rated either true or false. Example questions include, "Have any of your closest relationships been troubled by a lot of arguments or repeated breakups?" and "Have you often felt that you had no idea of who you are or that you have no identity?" The true items are summed to create a total score on the measure, with higher scores being indicative of more BPD symptoms. The authors report good sensitivity and specificity when the suggested cutoff of 7 or more items endorsed is used to classify participants as having BPD, although alternative scoring approaches have been used (Melartin, Häkkinen, Koivisto, Suominen, & Isometsä, 2009). This study used the screener as a continuous measure of BPD symptoms. The internal consistency was questionable in this psychologically healthy sample ($\alpha = 0.66$), perhaps due to a restricted range (i.e., nearly 75% of participants endorsed 3 items or less).

Current mood state. Participants completed the Mood Form (MF; Diener & Emmons, 1984) to provide a measure of current mood state before (Time 1) and after (Time 2) the experimental manipulation. The Mood Form is a 9-item self-report questionnaire which requires participants to rate the intensity of the emotions that they are experiencing at the present

moment. Several response scales have been used with this instrument; the present study used a 0 to 100 visual analog scale to collect participant responses. Items on the Mood Form comprise two factors: positive affect (4 items) and negative affect (5 items). Research has evidenced strong internal consistency for both positive affect and negative affect, as well as convergent validity with other scales measuring affect (Heckman, Ditre, & Brandon, 2012; Perkins, Karelitz, Conklin, Sayette, & Giedgowd, 2010), such as the Positive and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988). Internal consistency for negative affect was acceptable Time 1 ($\alpha = 0.74$) and good at Time 2 ($\alpha = 0.84$), and was good for positive affect at both Time 1 ($\alpha = 0.90$) and Time 2 ($\alpha = 0.93$).

Emotion Dysregulation Outcome Measures

Self-invalidation. Participants completed an experimenter-created measure of self-invalidation (see Appendix A) in order to assess the extent to which participants invalidated the emotions they reported experiencing during a past conflict situation. Participants were provided with a list of 9 emotion words (disappointed, sad, depressed, annoyed, angry, enraged, pleasant, happy, joyful) and used an unmarked visual analog scale ranging from 0 to 100 to rate (1) their experiences of these emotions *at the time of the event that they had described* ("felt ratings") and (2) how much they felt it was acceptable to feel those emotions during the event they described ("acceptance ratings"). In order to allow for a comparison of what a participant reported feeling and what he or she believed was acceptable to feel, discrepancy scores were first calculated by subtracting the acceptable ratings from the felt ratings, taking the absolute value of the difference. For example, if a participant reported a felt rating of 50 and an acceptance rating of 45, the discrepancy score would be 5. Similarly, if a participant reported a felt rating of 45 and an acceptance rating of 50, the discrepancy score would also be 5. The absolute value was used

because I was interested specifically in the discrepancy between felt and acceptance ratings. Given the lack of attention to the construction of self-invalidation in previous research, there was no reason to expect that directionality (i.e., whether felt or acceptance ratings were higher than their counterpart) would be meaningful. After discrepancy scores were calculated, the self-invalidation score was determined by creating a mean score across all emotion words. Scores on the overall self-invalidation score could range from 0 (*no self-invalidation*) to 100 (*extreme self-invalidation*) with higher scores indicating a greater discrepancy, or greater levels of self-invalidation. This measure was administered before and after the conversation task to assess for changes as a result of the experimental manipulation. Internal consistency in this sample was good before and after the manipulation ($\alpha_{T1} = .89$, $\alpha_{T2} = .90$).

Distress tolerance. The Distress Tolerance Test (DTT), as outlined in Nock and Mendes (2008), was used as a behavioral measure of distress tolerance. The DTT was administered using the stimulus cards from the Wisconsin Card Sort Test (WCST; Grant & Berg, 1948; Heaton, Chelune, Talley, Kay, & Curtis, 1993). The task began according to the original WCST manual; four cards were dealt face up on the table and the experimenter indicated that the participant must match cards and, although she cannot provide instructions regarding how to match the cards, she will give feedback when cards are matched correctly or incorrectly. Following the DTT procedure, participants were also told that there were 60 total cards, and that they needed to get through 20 of them, but that they could stop at any time after that point. The feedback was actually scripted, thus the experimenter responded "correct" to the first 3 cards placed, "incorrect" to the next 7 cards placed, "correct" to the 11th card placed, and "incorrect" to all remaining cards placed, regardless of where the participant placed the cards. The participant was notified at the 20th card. Card tasks have successfully been used to create distress in past research

(Hirito & Seligman, 1975; Ruggero & Johnson, 2006), and the authors reported that the DTT resulted in earlier quit points for self-injurers (a population theorized to have impaired distress tolerance) compared to non-injurers (Nock & Mendes, 2008).

Social problem solving skills. Participants completed six scenarios from the Social Problem Solving Skills Test (SPST; Nock, 2006), a performance-based task in which participants listen to audio recordings describing social conflict scenarios. Several scenarios were slightly modified from the original SPST phrasing to make them more relevant to a college sample (e.g., making the antagonist a roommate rather than a parent in the following scenario). For example, the participant might hear, "You had a really hard day at school and you come home really tired and stressed out. As soon as you walk in your roommate follows you into your room and starts lecturing you about cleaning up your mess." After each scenario participants are audio-recorded as they are asked to: (1) describe why the antagonist in the situation behaved the way they did, (2) generate as many solutions to the problem as possible in 30 seconds, (3) select the solution that they would most likely perform from the list that they generate, and (4) rate their ability to perform a model response given on a Likert scale. After the study, trained coders scored the valence of the likely outcome of each solution (negative, neutral, or positive) and recorded the total number of solutions generated. Nock (2006) reported acceptable reliability for all coded responses on this task (as cited in Nock & Mendes, 2008). The present investigation used this task as a behavioral measure of behavioral problem solving.

Procedure

All procedures used for this study were approved by the Institutional Review Board at the University of Arkansas. Potential participants first completed the prescreening measures to determine eligibility to participate in the experiment (described previously). Eligible participants

were invited to complete the laboratory study alongside an experimenter confederate, who pretended to be a second participant. Participants were informed that the purpose of the study was to investigate the sharing of emotional experiences during peer conversations and would involve telling a story to a peer, completing a card task, completing a verbal task, and filling out several questionnaires. Upon arrival, participants heard an auditory description of the study and written consent to participate was obtained. Participants then completed the pre-experiment individual difference measures and baseline Mood Form. They were also asked to type a description of two events that occurred in the last year which involved a conflict with a significant other, a close friend, or a family member during which they remembered feeling very emotional or upset. They completed the first self-invalidation measure (Time 1) immediately after each conflict was described.

Following completion of these computerized questionnaires, participants were led into a second room along with the confederate to start the conversation task used to conduct the experimental manipulation. To create a positive expectancy for the conversation task, participants were given accurate feedback regarding their personality scores on the BFI and were told that their personality profile very closely matched the profile of the other participant. The experimenter also told the participants that one person would have to share one of the conflict situations they wrote about with the other participant so that the pair could engage in a conversation during which an emotional event is shared. Participants then listened to a recorded example of a "model" conversation to familiarize them with the task and help to prompt a high level of detail during the conversation. The model conversation, guided by experimenter prompts, involved a conversation between two people. One person on the recording was clearly the primary speaker and the other person responded with sympathy and support, thus setting up

expectancy for validation. Participants were selected to be the speaker using a fake

randomization (i.e., choose a number between 1 and 10) in which the true participant was always

selected to be the speaker. Participants were asked to take a minute to decide which story they

would like to talk about. When the participants were ready, the experimenter went into another

room where she administered conversation prompts via a webcam on which video feed was

disabled (i.e., participants could hear her voice but not see her). The experimenter prompts were

based on a protocol reported by Feiring, Jashar, and Heleniak (2010) and included: (1) "Please

tell (confederate) a story about one of the conflicts you listed on your sheet earlier," (2) "Can you

walk (confederate) through what happened during the conflict in greater detail?," (3) "Please tell

(confederate) how you felt during that event," and (4) "Please tell (confederate) how you think

the others involved in this situation felt during the event."

Participants were randomly assigned to either the validating or invalidating condition.

The confederate's response to the participants consisted of semi-scripted remarks that varied

depending on the condition to which the participant was randomized. In the validating condition,

the confederate mimicked the responses heard in the model conversation. Specifically,

confederates made three comments to each participant. First, after the participant completed the

story (prompt 2), the confederate reflected back what the speaker said (to clarify, this was a

comment that varied based on the information shared). Second, after the participant shared his or

her emotions (prompt 3), the confederate stated "I think it makes total sense that you feel [insert

emotion word expressed by the listener]. That seems like a really difficult situation." Third, after

the participant finished sharing the emotions other people in the event felt (prompt 4), the

confederate stated, "Thanks for sharing that with me. That must have been a hard thing to do."

As this experience involved face-to-face contact, the confederate also displayed validating body

language (e.g., made appropriate eye contact, leaned slightly toward the participant while he or she was speaking, and nodded her head to indicate understanding of the situation to the participant). In the invalidating condition, the prompts appeared at the same time during the script but varied slightly in content. First, the confederate stated, "Can you repeat that again? I really wasn't listening," after the participant completed a full description of the event (prompt 2). Second, the confederate stated, "Really? It's kind of weird you felt that way. I had a similar situation happen to me and it didn't bother me at all. Life is full of troubles and I think it's just best to get over them" after the participant shared his/her emotions (prompt 3). Third, the confederate stated, "Thanks for telling your story. I really couldn't think of any conflicts to talk about so I'm glad I wasn't the speaker. I guess I just have less problems," after the participant shared the emotions other people felt (prompt 4). Additionally, the confederate's nonverbal communication indicated disinterest (e.g., stared into space and avoided eye contact, lacked facial expression in response to the participant's story, and leaned away from participant while he or she was speaking). The comments in this exercise were selected to mimic several forms of invalidation mentioned in Linehan's Biosocial theory (1993). The confederates used in both scenarios were trained female research assistants.

Following completion of the experimental manipulation, the experimenter reported that the participants would complete the remainder of their tasks separately. The confederate was positioned at a computer station while the true participant was still in the room. The participant was then was asked to leave with the experimenter to complete the remaining tasks in a separate laboratory room. The participant next completed the post-manipulation self-invalidation measure and Mood Form (Time 2), the Distress Tolerance Task, and the Social Problem Solving Skills Task. At the end of the study, participants completed a measure that inquired about how

validating or invalidating they perceived their partner to be using an unmarked visual analog

scale ranging from 0 to 100. Higher ratings indicated more positive feelings toward their partner.

Questions included, "My conversation partner understood my feelings," "I felt like my

conversation partner listened to me carefully," "I felt comfortable talking to my partner," and "I

would enjoy talking to my conversation partner again." Participants also rated their reaction to

the Distress Tolerance Task (i.e., frustration, distress, enjoyment, fun) using Likert scale from 1

(*strongly disagree*) to 7 (*strongly agree*). Participants were debriefed, including a full description

of the experimental manipulation. Participants in the invalidating condition were also assured

that their emotions were valid. All participants were given the option to watch 10 minutes of a

humorous film before leaving the laboratory.

Results

Sample Characteristics and Preliminary Analyses

Descriptive statistics for gender, age, mean level of current distress, and all baseline

questionnaires are summarized for all participants who completed the laboratory session, as well

as split by experimental group, in Table 1. Participants were primarily Caucasian (79%),

primarily female (63%), and had a mean age of approximately 19 years. In order to ensure that

participants were indeed randomized to condition, independent samples *t*-tests were used to

compare individuals in the validating and invalidating conditions on the following measures:

state positive affect (MF), state negative affect (MF) emotional distress (BSI), emotion

dysregulation (DERS), comparative self-criticism (LOSC), internalized self-criticism (LOSC),

distress tolerance (DTS), rejection sensitivity (RSQ), and borderline symptoms (MSI-BPD).

Group means did not differ significantly on these variables (see Table 1).

Prior to hypothesis testing, I also examined descriptive statistics for the self-invalidation measure. Skewness and kurtosis for self-invalidation before and after the manipulation were within acceptable limits; however, although potential scores ranged from 0 (*no self-invalidation)* to 100 (*extreme self-invalidation*) most participants had an average self-invalidation score less than 40 (90% at Time 1 and 96.7% at Time 2). Median self-invalidation scores at each of these time points were also fell very low on the intended range of the scale (Mdn_{T1} = 10.73, Mdn_{T2} = 11.6). Also, the highest self-invalidation score at Time 1 was 80.07 and was 66.93 at Time 2, further demonstrating truncation of the intended range.

Manipulation Check

In order to determine the effectiveness of the invalidation and validation manipulations, participants were asked to answer three questions regarding their conversation partner. Preliminary Levene's tests for equality of variances indicated that the variances of the two experimental conditions were significantly different on each of these questions, thus the test statistic was adjusted to reflect the violation of this assumption. Providing support for the effectiveness of the experimental manipulation, participants who were invalidated reported that they felt less heard and respected (*M* = 29.51, *SD* = 25.42) than those who were validated (*M* = 91.25, *SD* = 8.95), *t*(54.96) = 15.21, *p* < .001. Similarly, participants who were invalidated reported less desire to talk to their partner again (*M* = 35.22, *SD* = 26.40) and reported that they had less of a good fit with their partner (*M* = 38.04, *SD* = 23.56) than participants who were validated (*M* = 86.45, *SD* = 14.31; *M* = 86.70, *SD* = 12.93), *t*(68.14) = 11.42, *p* < .001 and *t*(68.63) = 12.11, *p* < .001 respectively.

Hypothesis Testing

The main analyses in this study addressed four hypotheses which examined the effect of the experimental manipulation on the measures of emotion dysregulation.

Hypothesis 1. The first hypothesis was that participants in the invalidating condition would evidence an increase in self-invalidation after the experimental manipulation, while participants in the validating condition would either decrease or maintain their self-invalidation scores from prior to the manipulation. These hypotheses were examined using two dependent samples *t*-tests to compare participants in the two conditions separately for changes on self-invalidation from Time 1 (before the manipulation) to Time 2 (after the manipulation). A dependent samples *t*-test for participants in the validating condition revealed that the difference between self-invalidation at Time 1 ($M = 16.78$, $SD = 16.46$) and Time 2 ($M = 15.64$, $SD = 14.84$) was not significant, $t(43) = .81$, $p = .42$. A second dependent samples *t*-test for participants in the invalidating condition revealed that the difference between self-invalidation at Time 1 ($M = 15.83$, $SD = 17.53$) and Time 2 ($M = 15.17$, $SD = 12.99$) was also not significant, $t(45) = .38$, $p = .71$.

Hypothesis 2. The second hypothesis was that participants who were invalidated would score higher on the measure of self-invalidation after the manipulation compared to participants who were validated, as higher scores are indicative of higher self-invalidation. An independent samples *t*-test revealed that invalidated participants ($M = 15.17$, $SD = 12.99$) did not evidence higher self-invalidation after the manipulation compared to validated participants ($M = 15.64$, $SD = 14.84$), $t(88) = .16$, $p = .87$.

Hypothesis 3. The third prediction was that participants in the validating condition would attempt to match more cards prior to quitting on the Distress Tolerance Task than participants in the invalidating condition. However, preliminary analysis of the data indicated that of the 90

participants, 62 participants (68.9%) elected to stop the task at the pre-determined optional quit-point (20 cards into the task). Thus, data for the Distress Tolerance Task was converted into a dichotomous variable which indicated if participants continued past the 20-card quit-point (coded as 1) or elected to stop the task after attempting to match 20 cards (coded as 0). A Pearson's chi-square test was performed to determine if validated or invalidated participants were distributed differently across quit-point on the Distress Tolerance Task. Contrary to expectation, there was not a significant association between experimental condition and quit-point, $\chi^2(1) = .36$, $p = .55$.

Hypothesis 4. Independent samples *t*-tests were used to test the hypothesis that participants in the invalidating condition would generate fewer overall solutions and report lower self-efficacy on the Social Problem Solving Skills Test than participants in the validating condition. Regarding the number of solutions generated, participants in the validating condition produced a slightly lower average number of solutions ($M = 3.41$, $SD = .91$) compared to participants in the invalidating condition ($M = 3.56$, $SD = 1.30$), but this difference was not significant, $t(87) = -.65$, $p = .52$. Subjects who were validated had slightly higher mean self-efficacy scores ($M = 3.17$, $SD = .43$) compared to subjects who were invalidated ($M = 3.01$, $SD = .47$), but this difference was also not significant $t(87) = 1.67$, $p = .10$.

Exploratory Analyses

Due to the unexpected nature of the findings of the present investigation, exploratory analyses were conducted to investigate additional questions related to the central hypotheses.

Self-invalidation. The present investigation is the first to attempt to influence self-invalidation using an experimental manipulation. Research addressing self-invalidation has been nonexistent in the literature to date, thus follow-up analyses examined whether self-invalidation

was related to other variables which it would be expected to relate to. Specifically, I examined

correlations between the baseline measures and self-invalidation prior to the experimental

manipulation (see Table 2). Thus, all participants who completed the baseline measures were

included in these exploratory analyses. Higher levels of initial self-invalidation were

significantly correlated with higher levels of emotion dysregulation, internalized self-criticism,

rejection sensitivity, and negative mood, as well as with lower distress tolerance. Interestingly,

initial self-invalidation was not significantly related to borderline features. This finding,

however, should be interpreting in light of the observation that nearly 75% of participants in this

psychologically healthy sample endorsed 3 items or less on this 10 item measure.

Additionally, because the self-invalidation measure was created for this study, I explored

a second method of scoring this measure. Specifically, I investigated the possibility that

participants might invalidate certain types of emotion more than others and thus the composite

measure of self-invalidation which included positively and negatively valenced words might

have masked self-invalidation of specific emotion categories. To explore this possibility, the

measure was split into three subscales each consisting of three items, anger (annoyed, angry,

enraged), sadness (disappointed, sad, depressed), and happiness (pleasant, happy, joyful), before

re-examining Hypotheses 1 and 2 using subscale scores, which also ranged from 0 (*no self-invalidation*) to 100 (*extreme self-invalidation*), instead of the composite score.

Dependent samples *t*-tests comparing self-invalidation of anger, sadness, and happiness

for each condition revealed no significant differences from Time 1 to Time 2 for either

participants who were validated or participants who were invalidated (See Table 3). Similarly,

participants who were invalidated did not report more self-invalidation of anger, $t(88) = -.18$, $p =$

participants who were invalidated produced a greater number of negative solutions compared to participants who were validated. An independent samples *t*-test revealed that invalidated participants produced marginally more negative solutions during the task ($M = 4.09$, $SD = 4.22$) than validated participants ($M = 2.80$, $SD = 2.59$), $t(75.26) = -1.76$, $p = .08$. This provides initial evidence that although participants who are invalidated may be able to produce approximately the same number of solutions as participants who are validated, people who are invalidated may tend to think of more negative ways to handle ambiguous social problems.

State affect by experimental condition. Given that the experimental manipulation did not have the predicted effect on any of the post-experimental measures, final exploratory analyses investigated whether participants in the validating versus invalidating condition experienced different changes in state affect as a result of the manipulation. Two separate 2 (time) x 2 (experimental condition) mixed ANOVAs explored changes in positive and negative affect from Time 1 to Time 2. The ANOVA for negative affect revealed a significant main effect of time on affect, $F(1,87) = 19.79$, $p < .001$. The main effect of condition on affect, $F(1, 87) = .06$, $p = .81$, and the interaction of time and experimental condition were not significant, $F(1, 87) = .77$, $p = .38$. In other words, participants in both groups experienced increased negative affect after the manipulation ($M_{validating} = 16.27$, $M_{invalidating} = 18.03$) compared to before the manipulation ($M_{validating} = 11.83$, $M_{invalidating} = 11.41$) and this increase did not vary significantly between the two groups. The ANOVA for positive affect revealed a non-significant main effect of condition, $F(1, 87) = .40$, $p = .53$ and a marginally significant main effect of time on affect, $F(1, 87) = 2.94$, $p = .09$. The interaction of time and experimental condition was nonsignificant, $F(1,87) = 2.14$, $p = .15$. These results indicate that participants in both groups experienced slightly less positive affect after the manipulation ($M_{validating} = 55.95$, $M_{invalidating} = 49.98$)

compared to before the manipulation ($M_{validating} = 56.38$, $M_{invalidating} = 55.32$). The lack of differential effects on mood by condition and time provides some evidence that the experimental manipulation was not as overtly strong as would have been desirable. On the other hand, these results might indicate that the nature of sharing a conflict situation with a peer in the laboratory is a negative affect inducing lab task, given the increase in negative affect for participants in both conditions.

Discussion

The purpose of this study was to understand the effect of emotion validation or invalidation on indices of emotion dysregulation. The first and second research hypotheses were related to self-invalidation. Past theoretical work postulated that individuals who experience invalidation when sharing their emotions or emotional experiences learn to invalidate their own emotions, a phenomena referred to as self-invalidation (Linehan, 1993). Thus, I hypothesized that individuals who were invalidated would evidence greater levels of self-invalidation after the manipulation as compared to their self-invalidation prior to the manipulation. Individuals who were validated were expected to maintain or decrease their level of self-invalidation from pre- to post-manipulation. Additionally, I hypothesized that individuals who were invalidated would evidence greater levels of self-invalidation after the experimental manipulation compared to individuals who were validated. Contrary to expectation, self-invalidation scores did not significantly differ for either of these hypotheses. The lack of significant findings is surprising given that self-invalidation is considered to be central to how invalidating experiences lead to emotion dysregulation in BPD.

One potential explanation for these results is related to the way that self-invalidation was measured in this experiment. The self-invalidation scale deliberately facilitated participants in

making direct comparisons between felt and acceptance ratings (i.e., the acceptance question for a particular emotion immediately followed the felt question for that same emotion). A participant could see where he or she had marked the "felt" Likert scale on an emotion, and easily make a conscious determination of where to mark the "acceptance" Likert scale in relation to the initial felt rating. As such, the possibility remains that self-invalidation is a more subtle process and that the overt comparisons between felt and acceptance ratings may have masked changes in self-invalidation by allowing participants to approach the rating by direct comparison. Furthermore, most participants were characterized by average self-invalidation scores that fell below the midpoint on the scale. While a lack of normative data for this scale makes interpretation difficult, selection of only healthy participants may have restricted the potential variability and reduced power to find significant effects.

In addition to the aforementioned possibilities, it is also reasonable to consider several ways in which the experimental manipulation itself could have contributed to the nonsignificant findings of the present investigation. First, it is possible that the experimental manipulation was not strong enough to elicit significant changes in self-invalidation. Exploratory analyses of participants' affective states before and after the manipulation revealed that participants in the two experimental conditions did not evidence differential changes in affect. Rather, participants in both conditions reported increased negative affect. Although not a preliminary hypothesis, I would have expected to find that participants who were invalidated would report increased negative affect, while participants who were validated would decrease or maintain their level of negative affect from prior to the manipulation. The findings of this study suggest that recounting a conflict situation and describing it to a peer induces negative affect, regardless of the peer's response. If invalidation and negative affect are typically associated, as would be expected based

upon theory and upon the significant correlation between self-invalidation and negative affect in the present study, the unexpected increase in negative affect for validated participants may have contributed to the similar self-invalidation scores between groups after the experimental manipulation. On the other hand, given that negative affect increased for both groups, a corresponding change in self-invalidation from pre- to post-manipulation would be expected for all participants, but this was not the case in the present study. A second potential explanation related to the experimental manipulation is that perhaps self-invalidation is type of response tendency that is not easily manipulated. It is likely that most people who would have met the screening criteria for this experiment had lower baseline levels of self-invalidation than would be found in clinical samples such as in individuals with BPD. One experience of invalidation, then, might not be strong enough to impact self-invalidation to a significant level, or perhaps might only result in an effect that was too weak to detect in this sample size. An observation that may give credence to the former possibility is that in a cursory review of the videotapes of participant and confederate interactions, it was not uncommon for participants to defend their feelings and responses to the conflict situation that they described. Arguably, people theorized to develop strong self-invalidation tendencies are individuals who experience repeated self-invalidation over relatively long periods of time, which was not the case in the manipulation used in this study. Despite the lack of significant effects, this study was the first to experimentally investigate self-invalidation and expanded beyond past research by even attempting to quantify self-invalidation. Given the lack of extant research to which to compare the present findings, the possibility also remains that invalidation does not actually cause self-invalidation as it has been theorized. Additional investigations which may confirm of refute the findings of the present study are sorely needed before making solid conclusions.

The third hypothesis was that participants who were invalidated would evidence less distress tolerance (attempt to match fewer cards on the Distress Tolerance Task) than participants who were validated. Contrary to expectation, there was no difference between conditions regarding whether participants chose to continue beyond the pre-determined optional quit-point. However, over two-thirds of participants discontinued the task at the optional quit-point, thus somewhat coloring the results of this hypothesis. The observed floor-effect was unexpected given that the author of the task did not report this as a problem (Nock & Mendes, 2008). In fact, this measure of distress tolerance was selected because more common tasks designed to measure distress tolerance suffered from ceiling effects in other research (Iverson et al., 2012). Future work using this particular measure of distress tolerance might benefit from altering it to combat the floor-effect; for example, either decreasing the number of mandatory cards prior to the optional quit-point or allowing participants to terminate the task at any time. This study, in combination with previous research, demonstrates a need for alternative measures of distress tolerance (i.e., tasks that capture more participant variability) before the effects of experimental manipulations on behavioral measures of distress tolerance can be meaningfully examined.

The final hypothesis was that individuals who were invalidated would provide fewer responses on the Social Problem Solving Skills Test and report lower self-efficacy when asked to rate their ability to perform a model response compared to people who were validated. Contrary to expectation, there were no statistical differences between the two experimental groups on either of these measures. There are several factors that could have contributed to this unexpected finding. First, there is some evidence that individuals who are emotionally dysregulated do not actually provide fewer answers on this task (Nock & Mendes, 2008). Research and theory does suggest that individuals who are invalidated, such as people with BPD, have impaired social

problem solving abilities (Kremers et al., 2006; Maurex et al., 2010; McMurran, et al., 2007).

Although I initially measured social problem solving performance as the participants' ability to

provide a number of potential responses to social conflicts, this study suggests that perhaps it is

not the ability to generate solutions that is impacted by invalidation, but instead the quality of the

solutions produced. Within the total solutions produced, each solution was considered to be

negative, neutral, or positive in content (as determined by trained coders). Exploratory follow-up

analyses conducted to examine the failure of this hypothesis revealed that participants who were

invalidated provided a marginally greater number of negative solutions during the Social

Problem Solving Skills Task than people who were validated. This finding is congruent with past

research which has found impairment in specific types of social problem solving when people

with BPD are compared to control participants (Kremers et al., 2006) and well as research

suggesting that BPD is associated with an impulsive/careless problem solving style in particular

(McMurran et al., 2007). Given that many of the responses that were coded as negative could be

described as demonstrating angry or hostility (e.g., solutions such as "I could beat them up," "I

could threaten to write mean things on the windows of their cars," and "Tell them how much

they suck"), this marginal effect also fits with research suggesting that people with BPD are

more quick to experience anger (Trull et al., 2008) and that individuals with BPD experience

more rage after experiencing rejection (Berenson, Downey, Rafaeli, Coifman, & Paquin, 2011).

Additional fine-grained analyses of the solutions provided might be another way to examine

potential group differences in problem solving that were not captured in this experiment.

Strengths and Limitations

The present investigation is one of the first attempts to translate processes theorized to

cause BPD into the laboratory setting where they can be manipulated. One strength of this study

is the use of an experimental design. Rather than relying solely on correlational data between adults' remembrances of childhood experiences and emotion dysregulation, the experimental design allowed me to test the proposed causal relationship between invalidation and indices of emotion dysregulation. This study also explored self-invalidation, which correlated in the correct direction with other baseline measures that it would be expected to relate to. More specifically, self-invalidation positively correlated with high emotion dysregulation, self-criticism, rejection sensitivity, and negative affect and negatively correlated with distress tolerance. All of these constructs have been previously established as being elevated among people with BPD (Berenson et al., 2011; Iverson et al., 2012; Kopala-Sibley, Zuroff, Russell, Moskowitz, & Paris, 2012; Staebler, Helbing, Rosenbach, & Renneberg, 2011). Importantly, this lends some validity to the measure of self-invalidation utilized in this study, even when the measure is utilized in a healthy sample.

This experiment also utilized arguably the most socially-situated manipulation to date, and took steps to create the expectation that the conversation task would be validating for all participants. In an attempt to create a sense of kinship between the participant and the confederate, participants were lead to believe they had a very similar personality as the partner that they were matched with. Similar methods have been used to increase emotional closeness between strangers in past research (Maner, Luce, Neuberg, Cialdini, Brown, & Sagarin, 2002). The emphasis on a socially-situated manipulation is important given that Biosocial theory (Linehan, 1993) conceptualized invalidation as a response to a shared emotional experience as particularly problematic.

Finally, unlike extant research, participants were not recruited based on their level of emotional reactivity or current borderline features. Results from studies using this strategy at the

time of the conceptualization of this investigation (i.e., prior to Chapman and colleagues' *in press* manuscript) had not demonstrated the expected effects of invalidation. Utilizing a healthy sample, while increasing the strength and personal relevance of the experimental manipulation, was a strong methodological choice for examining causal relations between invalidating experiences and emotion dysregulation.

There are also several limitations that should be considered when interpreting the findings of the present study. First, the present research investigated the impact of *one* experience of invalidation on indices of emotion dysregulation. Invalidation leading to emotion dysregulation has not been regarded as a single-instance experience. Rather, invalidation is typically a strong environmental characteristic and is frequently repeated in the case of individuals with BPD. Repeatedly invalidating participants would be ethically problematic, and past research provided precedent for examining a single instance of this phenomena. Although it was expected that a single instance of invalidation would lead to state-level changes, which is why the choice to utilize behavioral measures was emphasized, the possibility that the manipulation was not as strong as needed to impact the measured outcomes remains a distinct possibility. Relatedly, exploratory analyses revealed a significant increase in negative affect following the experimental manipulation, regardless of the condition to which participants were assigned. This suggests that engaging in a conversation with a peer about a conflict situation increases negative affect, even if that conversation is designed to be validating, and may be another reason for the lack of effects on the outcome variables in this study. Also, while the experiment utilized healthy participants hoping to demonstrate the effects of invalidation in a population that is not already characterized by the dysregulation found in people with BPD, the design likely limited the range of reactivity to the manipulation. Healthy participants may not

have been as amenable to be influenced by the experimental manipulation utilized in this study

which was crucial to examining invalidation as a process linked to self-invalidation, distress

tolerance, and social problem solving.

Another limitation is that the present study used a confederate to carry out the

experimental manipulation. Invalidation is typically conceptualized as occurring in previously

established social relationships – and especially in context of caregiving relationships. Although

this was an important methodological decision intended to preserve experimental control, it may

have decreased the strength of the manipulation (i.e., if the confederate's feedback was

disregarded). It is possible that the manipulation would have been more effective if the

manipulation was carried out through someone with whom the participant had a previous social

relationship. For example, I could have recruited individuals who already knew one another (i.e.,

friends, family members, significant others) and then trained one person to validate or invalidate

prior to the start of the laboratory session. This approach may have lessened the increase in

negative emotion as a result of the storytelling exercise among participants who were validated,

and may have increased the impact of the invalidation. On the other hand, such a procedure

would likely introduce confounds such as the type of relationship, closeness, and the degree of

conflict already existing in these relationships.

A final limitation of this investigation was the decision to examine solely invalidation,

rather than the interaction between emotional vulnerability and invalidation that is proposed in

the Biosocial model. Although other work (Koerner, 2005; Leahy, 2005) suggests that

invalidation alone should have consequences for emotion regulation, regardless of a person's

predisposition, the lack of significant findings in this study might suggest that invalidation needs

to be strong and occur over a substantial period of time to impact indices of emotion

dysregulation. It is also possible that invalidation truly does not influence emotion dysregulation without some level of pre-existing vulnerability. Even repeated instances of invalidation may thus cause emotion dysregulation because these experiences either interact with or alter vulnerability over time.

Future Directions

Despite its limitations, this study represents an important step in the testing the relation between invalidation and emotion dysregulation. It contributes to the literature because the effects of invalidation have long been accepted in the field of psychology despite little empirical evidence. Yet, more research is needed to come to firm conclusions regarding the validity of the Biosocial model (Linehan, 1993) or even the distinct influence of invalidation of emotion.

An initial important direction for future work is to continue examining self-invalidation. There is still a need to explore additional ways to measure this construct, both behaviorally and via other methods of self-report aside from the method used in this study. For example, examining the discrepancy between "felt" ratings on the self-invalidation measure from Time 1 to Time 2 might help capture a more subtle form of self-invalidation than the overt comparisons between "felt" and "acceptance" ratings used in the present investigation. Another way of examining expressed verbal self-invalidation is as it spontaneously occurs in narratives. Verbal comments that were self-invalidating were observed during a review of the videos by both the principle investigator and the research assistant who rated sessions for script adherence. Although these verbalizations appear fairly infrequent based on the cursory review of the tapes, responses to invalidation could be coded among participants in the invalidating condition and the relation between behavioral and self-reported invalidation (and other responses) could be examined.

A second potential direction for future research would be to examine a moderating effect of individual difference factors that are theoretically related to emotional vulnerability (e.g., emotional reactivity, temperament). Although emotional vulnerability is likely altered somewhat by the time an individual reaches adulthood and cannot be manipulated experimentally, measuring and examining it statistically remains an unexamined possibility. One would expect that previous research which recruited participants based on borderline personality symptoms and emotional reactivity would have demonstrated more promising results if this was the case (e.g., Reeves, 2007; Woodberry et al., 2008); however, statistical moderation among a general or healthy sample of participants using a strong socially-based manipulation has yet to be explored.

The ultimate test of a model such as Linehan's Biosocial theory (1993) would examine these processes longitudinally and developmentally. Given that biological vulnerability is theoretically a factor that is present at birth, emotions are socialized beginning in early childhood, and invalidation is conceptualized as a process that is experienced at the hands of caregivers, examining these processes in children or adolescents may be an important expansion of research that has thus far been confined to adult samples.

Conclusions

In sum, the present investigation is one of the first to attempt to translate the processes theorized to cause BPD into the laboratory setting where they can be manipulated and examined independently. This study improved on past research by emphasizing invalidation as a process that occurs in a social context where one person shares personally-relevant emotional information with another person, by emphasizing behavioral measures of emotion regulation following the experimental manipulation and by examining self-invalidation as a relevant process. While the main hypotheses in this study were not confirmed, evidence supporting

Biosocial theory as a model of how BPD develops has been mixed. Exploratory analyses examined self-invalidation, which was correlated with higher emotion dysregulation, internalized self-criticism, rejection sensitivity, and negative affect, as well as with lower distress tolerance. Experiencing invalidation was also associated with marginally higher self-reported distress during a challenging card task, and with a marginally higher number of negative solutions generated during a social problem solving task. While the lack of significant effects on the main experimental hypotheses was surprising, future research on the impacts of validating and invalidating social feedback is needed before making firm conclusions on the impact of these phenomena.

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Table 1. *Descriptive Data for Demographic Data and Baseline Questionnaires*

		Participant Group				
		Total Sample *M* or *n* (*SD* or *%*) *N* = 114	*Invalidated* *M* or *n* (*SD* or *%*) *N* = 57	*Validated* *M* or *n* (*SD* or *%*) *N* = 57	*t*-test	*p*
Demographics						
Age		18.98 (1.14)	18.88 (1.17)	19.09 (1.11)	.99	.33
Sex						
	Female	72 (63.2%)	36 (63.2%)	36 (63.2%)		
Race						
	Caucasian	90 (78.9%)	45 (78.9%)	45 (78.9%)		
	African American	10 (8.8%)	3 (5.3%)	7 (12.3%)		
	Asian	5 (4.4%)	4 (7%)	1 (1.8%)		
	American Indian	4 (3.5%)	3 (5.3%)	1 (1.8%)		
	Hispanic/Latino	3 (2.6%)	2 (3.5%)	1 (1.8%)		
	Other	2 (1.8%)	0 (0%)	2 (3.5%)		
Baseline Questionnaires						
Emotion Dysregulation (DERS)		67.73 (13.62)	68.39 (11.05)	67.07 (15.85)	-.51	.61
Comparative Self-Criticism (LOSC)		35.09 (9.10)	34.67 (9.13)	35.51 (9.13)	.49	.62
Internalized Self-Criticism (LOSC)		40.25 (13.00)	42.35 (11.69)	38.14 (13.97)	-1.75	.08
Distress Tolerance (DTS)		56.93 (9.94)	56.74 (9.58)	57.12 (10.37)	.21	.84
Rejection Sensitivity (RSQ)		8.76 (3.41)	8.98 (3.23)	8.54 (3.61)	-.69	.50
Borderline Symptoms (MSI)		2.17 (1.97)	2.13 (2.02)	2.21 (1.94)	.23	.82
Negative Affect (MF)		11.25 (12.98)	10.52 (11.31)	11.98 (14.56)	.60	.55
Positive Affect (MF)		55.68 (26.38)	54.21 (24.95)	57.15 (27.88)	.59	.55
Emotional Distress (BSI)		.36 (.33)	.35 (.30)	.38 (.37)	.37	.71

Table 2. *Correlations between pre-manipulation self-invalidation and baseline measures*

	1	2	3	4	5	6	7	8	9
1. Self-invalidation	-	.22[+]	.16	.28*	-.31*	.23[+]	.11	-.04	.31*
2. Emotion Dysregulation		-	.64**	.51**	-.64**	.38**	.60**	-.41**	.38**
3. Comparative Self-Criticism			-	.46**	-.45**	.50**	.59**	-.37**	.39**
4. Internalized Self-Criticism				-	-.46**	.33*	.45**	-.35*	.36*
5. Distress Tolerance					-	-.35*	-.55**	.31*	-.35*
6. Rejection Sensitivity						-	.30*	-.40**	.38**
7. Borderline Symptoms							-	-.39**	.33*
8. State Positive Affect								-	-.50**
9. State Negative Affect									-

[+] $p < .05$, * $p < .01$, ** $p < .001$

Table 3. *Self-invalidation subscale scores at Time 1 compared to Time 2*

| | Time Point | | | |
| | *Time 1* | *Time 2* | | |
	M (*SD*)	*M* (*SD*)	*t*-test	*p*
Invalidated Group				
Anger	23.39 (24.34)	20.58 (17.83)	-1.30	.20
Sadness	15.67 (17.80)	17.97 (15.92)	-1.37	.18
Happiness	6.88 (17.44)	8.69 (14.32)	-1.12	.27
Validated Group				
Anger	20.44 (20.19)	19.86 (19.58)	.36	.72
Sadness	16.32 (18.25)	16.90 (15.79)	-.28	.78
Happiness	11.35 (20.61)	9.78 (20.15)	.98	.33

Table 4. *Self-reported emotion during the Distress Tolerance Task, separated by experimental group*

| | Participant Group | | | |
| | *Invalidated* | *Validated* | | |
	M (*SD*)	*M* (*SD*)	*t*-test	*p*
Emotion Word				
Frustrating	4.76 (1.77)	4.91 (1.67)	.42	.68
Distressful	3.38 (1.47)	2.84 (1.43)	-1.75	.08
Enjoyable	3.18 (1.71)	3.66 (1.90)	1.26	.21
Fun	3.09 (1.79)	3.73 (1.89)	1.64	.11

Appendix A

Self-Invalidation Measure:

Situations that involve conflict with other people who are important to us often involve us feeling a variety of emotions. Sometimes, we feel certain emotions even though we believe we should not feel that way.
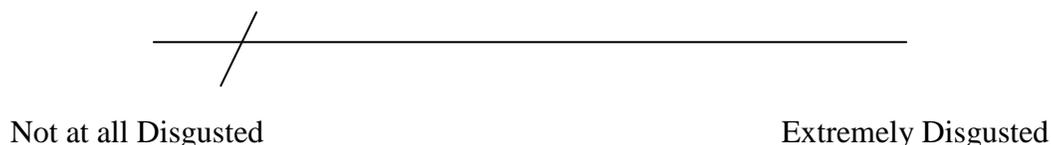
Please rate the extent to which you felt the following emotions at the time of the event you described, by placing a single slash mark (/) somewhere across the line below. Then, rate the extent to which you believe you should have felt those emotions at the time of the event.

For example, I may remember that I felt very disgusted when I watched a centipede crawl across the floor, even though I believed I should not have felt disgusted. So to show this, I might mark toward the right side of the line indicating that I was very disgusted in response to question 1. Then, I might mark toward the left side of the line for question 2, indicating that I believe I should have been not very disgusted.

1. How disgusted did you feel at the time of this event?

Not at all Disgusted   Extremely Disgusted
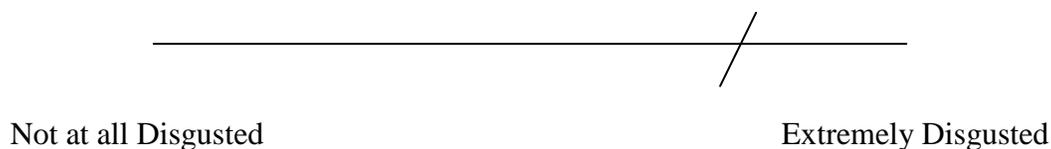
2. How disgusted do you believe you should have felt at the time of this event?

Not at all Disgusted   Extremely Disgusted

Instruction Reminder: Please rate the extent to which you felt the following emotions at the time that the first event you described, followed by the extent to which you believe you should have felt those emotions at the time of the event, by placing a single slash mark (/) somewhere across the line below.

1. How angry did you feel at the time of this event?

—————————————————————————

Not at all Angry   Extremely Angry

2. How angry do you believe you should have felt at the time of this event?

—————————————————————————

Not at all Angry   Extremely Angry

3. How pleasant did you feel at the time of this event?

—————————————————————————

Not at all Pleasant   Extremely Pleasant

4. How pleasant do you believe you should have felt at the time of this event?

—————————————————————————

Not at all Pleasant   Extremely Pleasant

5. How depressed did you feel at the time of this event?

_____

       Not at all Depressed   Extremely Depressed

6. How depressed do you believe you should have felt at the time of this event?

_____

       Not at all Depressed   Extremely Depressed

7. How disappointed did you feel at the time of this event?

_____

       Not at all Disappointed   Extremely Disappointed

8. How disappointed do you believe you should have felt at the time of this event?

_____

       Not at all Disappointed   Extremely Disappointed

9. How joyful did you feel at the time of this event?

_____

       Not at all Joyful   Extremely Joyful

10. How joyful do you believe you should have felt at the time of this event?

_____

      Not at all Joyful   Extremely Joyful

11. How enraged did you feel at the time of this event?

_____

      Not at all Enraged   Extremely Enraged

12. How enraged do you believe you should have felt at the time of this event?

_____

      Not at all Enraged   Extremely Enraged

13. How sad did you feel at the time of this event?

_____

      Not at all Sad   Extremely Sad

14. How sad do you believe you should have felt at the time of this event?

_____

      Not at all Sad   Extremely Sad

15. How annoyed did you feel at the time of this event?

_____

    Not at all Annoyed   Extremely Annoyed

16. How annoyed do you believe you should have felt at the time of this event?

_____

    Not at all Annoyed   Extremely Annoyed

17. How happy did you feel at the time of this event?

_____

    Not at all Happy   Extremely Happy

18. How happy do you believe you should have felt at the time of this event?

_____

    Not at all Happy   Extremely Happy