DELINEATING THE UNIQUE CONTRIBUTIONS OF MINDFULNESS SKILLS IN PREDICTING ENGAGEMENT IN SUICIDE ATTEMPTS AND NON-SUICIDAL SELF-INJURY AMONG INDIVIDUALS WITH BORDERLINE PERSONALITY DISORDER

by

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Delineating the unique contributions of mindfulness skills in predicting engagement in suicide attempts and non-suicidal self-injury among individuals with borderline personality disorder

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Abstract

The current research tested whether four dimensions of mindfulness – acceptance without judgment, observing, describing and acting with awareness – taught during 20 weeks of dialectical behavior therapy skills training (DBT-ST) predicted frequency of two forms of self-inflicted injury (SII), i.e. suicide attempts (SAs) and non-suicidal self-injury (NSSI), at baseline and mediated the relationship between pre-post treatment change in frequency of SAs/NSSI and DBT-ST. Eighty-four suicidal individuals with borderline personality disorder were enrolled in a single-blinded randomized trial comparing DBT-ST treatment to a waitlist control group. A series of regressions revealed no relationship between dimensions of mindfulness and self-inflicted injury at baseline. Although no significant effect of DBT-ST on SAs was found, a causal mediation analysis revealed acceptance without judgment significantly mediated the relation between DBT-ST and change in frequency of NSSI.

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Borderline personality disorder (BPD) is a severe mental disorder characterized by the experience of intense negative emotions coupled with difficulties tolerating and regulating these emotions. These deficits in emotion regulation result in a constellation of behavioural difficulties including anger outbursts, suicidal behaviours (including suicide attempts and non-suicidal self-injury), and persistent feelings of emptiness (American Psychological Association, 2013; Linehan, 1993). Among these behaviours, previous suicide attempts (SAs) and non-suicidal self-injury (NSSI) pose the most imminent risk to individuals suffering from BPD. Up to 90% of individuals with BPD engage in non-suicidal self-injury (NSSI), 70% will attempt suicide and 4-10% will die as a result (Black et al., 2004; Zanarini et al., 2005; Wedig et al., 2012). Consequently, self-inflicted injury (SII), constituting SAs and NSSI, significantly contributes to impairment in everyday functioning, high mortality rates and a level of health-care service utilization that surpasses more prevalent disorders such as depression (Bender et al., 2001; Zanarini et al., 2008). Thus, gaining a better understanding of SII in BPD can have a significant health and economic impact.

Dialectical Behavioural Therapy (DBT) was originally developed as a treatment for suicidal behaviors and has since evolved into a comprehensive treatment for BPD (Linehan, 1993). As its name suggests, DBT takes a dialectical approach that balances acceptance and change in the reduction of maladaptive behaviours such as SII. The inclusion of acceptance-based strategies is based on the rationale that failure to accept one's experience may contribute to a number of psychological difficulties; that acceptance is the first step in the process of change (i.e. one must first accept and become fully aware of their experiences before they can be changed); and that a singular focus on

behavioural change can be unrealistic, leading the individual in treatment to feel overwhelmed and demoralized (Linehan, 1993). To this end, DBT combines traditional behaviour modification strategies derived from the operant tradition with mindfulness, an acceptance-based approach primarily inspired by the philosophies of Zen Buddhism. The mindfulness skills module is the first of the four skills modules taught in DBT skills training and provides the foundation for all remaining skills: interpersonal effectiveness, emotion regulation and distress tolerance. Although mindfulness is at the heart of DBT, and DBT has proven efficacious in reducing SII among individuals with BPD (Koons et al., 2001; Linehan et al., 1991; Linehan et al., 2006; Verheul et al., 2003; McMain et al., 2009), the specific relationship between mindfulness skills and engagement in SII remains largely unexamined. The current research addresses this gap in the literature by examining the relationship between mindfulness skills and the frequency of SII, before, during and after 20 weeks of DBT skills training (DBT-ST).

Characteristics of SIIs

SII is any form of intentional physical harm enacted on oneself (Nock, 2010). SII occurs on a continuum, with some individuals engaging in self-injury without any intention or thoughts of suicide (i.e., non-suicidal self-injury [NSSI]), while others may only inflict injury upon themselves in an attempt to end their lives (i.e., suicide attempt). NSSI and SAs vary not only by intention but also in terms of frequency and method (Hamza, Stewart & Willoughby, 2012; Muehlenkamp, 2014). NSSI occurs more frequently and chronically in the form of less lethal methods such as cutting, head banging, burning, scratching or biting (Bracken-Minor & McDevitt-Murphy, 2014). SAs,

on the other hand, are less frequent and involve more severe methods such as self-poisoning or firearms (Hamza, Stewart & Willoughby, 2012; Muehlenkamp, 2014).

Notably, SII is linked to psychopathology other than BPD, particularly depression. Indeed, among a sample of individuals who engaged in "near fatal" SII, 50% of those individuals met criteria for major depressive disorder (MDD; Douglas et al., 2004). In the US National Comorbidity Study, 42% of individuals who engaged in NSSI and over half of suicide attempters reported experiencing MDD in their lifetime (Nock & Kessler, 2006). Notably, MDD is one of the most common comorbidities with BPD (Grant et al., 2008), and thus, it is critical that an examination of SII in a BPD sample account for the presence of MDD.

Functions of SII

The primary theoretical models of SII adopt a functional approach to NSSI and SA, and propose that these behaviours are maintained by the reinforcing nature of their consequences (Klonsky, 2007). While individuals report expecting positive consequences (i.e. positive reinforcement) such as a sense of calm following NSSI, research suggests that the primary function of both NSSI and SAs is escape and avoidance of negative experiences (i.e. negative reinforcement; McKenzie & Gross, 2014; Baumeister, 1990; Brown, Comtois & Linehan, 2002; Chapman, Gratz & Brown, 2006; Gratz, 2003; Haas & Popp, 2006; Nock & Prinstein, 2004; Joiner, 2005; Van Orden et al., 2006). SII has thus been conceptualized as a behavior of experiential avoidance, which involves an unwillingness to engage with aspects of one's experience as well as attempts to alter its "form and frequency" even when such avoidance is detrimental (Hayes et al., 1996). Studies indicate that SII functions to reduce negative *inter*personal experiences, such that

NSSI is used to provide an escape from distressing social situations (e.g. injury providing an excuse not to participate in a social event; McKenzie & Gross, 2014) and SA functions to relieve the burden one perceives to inflict upon others (Nock & Prinstein, 2004; Klonsky, 2007; Joiner, 2005; Van Orden et al. 2006). However, *inter*personal functions are less frequently reported and often secondary to the use of SII to regulate aversive *intra*personal stimuli such as thoughts, emotions and sensations (Klonsky, 2007; Bryan, Rudd, & Wertenberger, 2013). Thus, the bulk of existing research and theoretical models suggest that NSSI and SAs function as a means to avoid or escape aversive experiences.

Consistent with high levels of SII seen in BPD**,** individuals with BPD report higher levels of experiential avoidance than healthy controls (Kuo & Linehan, 2009; Iverson et al., 2011). In a sample of individuals with suicidal ideation and three or more BPD symptoms, Iverson and colleagues (2011) found that higher levels of experiential avoidance predicted higher BPD severity (including self-harm), after controlling for depression. Further evidence for an association between experiential avoidance and BPD comes from research examining the use of thought suppression to control one's emotions. In two separate studies, thought suppression fully mediated the positive relationship between self-reported negative affect intensity and BPD features (i.e. a combined score of interpersonal sensitivity, aggression and impulsivity) in student and community samples suggesting that the relationship between emotional avoidance and BPD features might also be explained through avoidance of thoughts (Cheavens et al., 2005; Rosenthal et al., 2005). Extant data thus suggest that avoidance of negative emotions – potentially through avoidance of thoughts- contributes to and exacerbates BPD severity and, potentially, engagement in NSSI and SAs.

SII as an escape

Non-suicidal Self-Injury (NSSI) as an escape. The escape function of NSSI is captured in a number of models. In the experiential avoidance model, Chapman and colleagues (2006) suggest that NSSI is an avoidant form of coping with intense emotions, which over time creates a vicious cycle that maintains avoidance and limits opportunities for learning distress tolerance (e.g., habituation). The emotional cascade model proposed by Selby, Anestis, Bender and Joiner (2009) also suggests that NSSI ultimately functions to escape intense overwhelming emotions. However, this model introduces an additional proposition that initial over-engagement with emotional stimuli or rumination causes emotions to become so overwhelming that only a more "potent" escape behaviour, such as NSSI, can disrupt this cycle of rumination and provide emotional relief. In each case, NSSI is prompted by the desire to escape from negative emotions and is maintained by negative reinforcement, i.e., the reduction of an aversive stimulus.

The intention to avoid or suppress aversive internal experiences has been cited as the primary reason for engaging in NSSI among student (e.g. Klonsky, 2009), community (e.g. Kamphuis, Ruyling & Reijntjes, 2007; Nock, Prinstein & Sterba, 2009), correctional (e.g. Chapman & Dixon-Gordon, 2007), and inpatient psychiatric samples (e.g. Briere & Gil, 1998). Klonsky (2007) reviewed 11 studies of self-reported functions of NSSI and found that affect regulation was the most commonly reported function in all of the studies. In the 4 studies that examined adult psychiatric samples, over 70% of participants reported engaging in NSSI for some form of internal relief such as "tension release," "to control their mind when it is racing" or "distraction from painful feelings" (Klonsky, 2007). Consistently, through the use of electronic diaries and structured

interviews, individuals have reported that negative emotions precede NSSI whereas decreases in negative emotion and increases in positive emotion follow injury (Klonsky, 2009; Nock, Prinstein, & Sterba, 2009; Klonsky, 2007; Chapman & Dixon-Gordon, 2007). The affect regulating properties of NSSI have been corroborated by changes in physiological correlates of emotion during lab proxies for NSSI. Two studies by Haines (1995) and Brain (1998) used imagery scripts based on participants' personal experiences with NSSI and examined subjective and physiological changes in affect while individuals were read their scripts. Self-report of emotions and physiological measures (e.g. heart rate) suggested that individuals with a history of NSSI experienced an increase in negative affect and arousal during the portion of the script before injury, which then decreased following injury.

A similar pattern of findings has been found for NSSI in individuals with BPD. More specifically, three self-report studies suggest that affect regulation is also the primary motive for NSSI among individuals with BPD (Brown, Comtois & Linehan, 2002; Kleindienst et al., 2008; Sadeh et al., 2014). Specifically, Brown, Comtois and Linehan (2002) found that 97% of their BPD sample endorsed at least one reason related to emotional relief. Similarly, Kleindienst et al. (2008) found that the most frequently endorsed motives for NSSI were tension relief and reduction of unpleasant feelings. Notably, Kleindienst et al. (2008) found that approximately 50% of individuals in their BPD sample reported engaging in NSSI for positive reinforcement. However, in each case, this was reported to be secondary to a negative reinforcement function. Thus, although some individuals report engaging in NSSI to increase pleasant experiences (i.e. sensation seeking or "getting a kick"), such positive reinforcement does not appear to be

a central function. While the consequences of NSSI may relate to changes in positive and/or negative emotions, the antecedents of NSSI are consistently reported to be intense negative emotions. Indeed, Chapman & Dixon-Gordon (2007) examined the antecedents and consequences of NSSI among a sample of self-injurers in a female penitentiary. A range of negative emotions- most commonly anger- were reported to precede NSSI while relief from negative emotion and an increase in positive emotion followed injury.

Consistent with self-report evidence, physiological laboratory studies also support the proposition that NSSI acts as a means of escape from intense negative affect for individuals with BPD. Welch, Linehan, Sylvers, Chittams and Rizvi (2008) found that individuals with BPD reported experiencing relief after listening to personally relevant imagery scripts of NSSI, but not following scripts of accidental injury. In a study with a high level of external validity, Rietz and colleagues (2012) looked at the effect of tissue damage, via a small forearm incision performed in the laboratory, on self-reported "aversive tension" and heart rate, a physiological correlate of distress. Heart rate and self-reported level of aversive tension decreased following incision in the BPD group but briefly increased in the healthy control group. This suggests that individuals with BPD find physiological relief from behaviors, such as NSSI, that are stressful to healthy individuals.

Suicide Attempts (SAs) as an escape. Similar to NSSI, escape from aversive experiences of the self and the world is a central theme in theories of suicide (Baumeister, 1990; Joiner, 2005). Baumeister (1990) describes suicide as an escape from aversive experiences of the self, and Joiner's (2005) Interpersonal Theory suggests that suicidal individuals are seeking escape from overwhelming feelings of social alienation and

perceived burdensomeness to others. This is corroborated by descriptive analyses of suicide notes in which individuals express an unwillingness to accept their current distress and a desire to escape from it as the reason for their suicide (Leenars, Haines, Wenckstern, Williams & Lester, 2003; Lester, Wood, Williams & Haines, 2003). In a sample of active duty soldiers, all 72 participants reported attempting suicide "to stop feeling bad" (Bryan, Rudd & Wertenberger, 2013). Consistently, the most commonly self-reported functions of SAs among individuals with BPD are emotional relief and the desire "to get away or escape" (Brown et al., 2002). In a study by Chapman and Dixon-Gordon (2007), female inmates reported that prior to attempting suicide, 77.27% experienced negative emotions and the remaining 13.6% reported indifference. While negative emotional antecedents of suicide provide support for the escape function of suicide, laboratory studies of the consequences of successful suicide are, of course, precluded by the nature of the act. Taken together, the desire for escape from negative emotions appears to play a central role in maintaining both NSSI and SAs.

Emotion-Specific Avoidance: Shame and Self-inflicted Injury (SII)

As noted, SII provides a means for escape from negative emotions, and one particularly relevant emotion is shame. Shame is an intense emotion that arises when one perceives the self as flawed and unacceptable to others (Crowe, 2004; Dearing & Tangney, 2011). Evidence suggests that the tendency to experience shame (i.e., "shame-proneness") is linked with NSSI and SAs (Kleindienst et al., 2008; Schoenleber, Berenbaum, Motl, 2014; Hastings, Northman, & Tangney, 2000; Tangney & Dearing, 2002).

Shame has been reported as both an antecedent and consequence of NSSI (Kleindienst et al., 2008; Schoenleber, Berenbaum, Motl, 2014). In a sample of community and student females, shame-proneness was significantly positively associated with total NSSI frequency, with approximately a three-fold increase in NSSI behaviours per unit of shame (Schoenleber, Berenbaum, Motl, 2014). The relationship between shame and self-punishment also provides a putative connection between shame and NSSI. Chapman, Gratz and Brown (2006) cite self-verification theory to explain why self-punishment may provide relief from shame. Self-verification theory suggests that individuals who experience themselves as unworthy and reprehensible (i.e. deserving of punishment) will feel relief after performing behaviours that are congruent with this negative self-concept (i.e. punishment). Consistently, self-punishment is the second most commonly reported reason for engaging in NSSI (Klonsky, 2007; Klonsky, 2009; Nock, 2009).

Similar to NSSI, shame and negative self-concept play a central role in a number of models, which conceptualize suicide as an escape from a sense of worthlessness and disconnection from others. Shame-proneness has been found to predict suicidal ideation cross-sectionally in a student sample (Hastings et al., 2000) and SAs prospectively over a 10 year period from childhood to early adulthood (Tangney & Dearing, 2002). Other self-related constructs similar to or suggestive of shame, such as a sense of social alienation and perceiving oneself as a burden to others, have been found to predict both SAs and suicide completion (Van Orden et al., 2006). Evidence for the role of shame also comes from research linking suicide and low self-esteem. Individuals with low self-esteem, similar to individuals who are shame-prone, judge themselves harshly and have low

appraisals of their self-worth. McGee, Williams, Nada-Raja (2001) found that self-esteem (defined as self-worth, confidence and self-approval) at ages 9 to 13 negatively predicted suicidal ideation at 18 and 21 years. Furthermore, both *self-based* self-esteem and *other-based* self-esteem (i.e. esteem based on what one perceives others think of them) were negatively correlated with suicidal ideation when controlling for hopelessness and depression.

The relation between SII and shame may be particularly salient for BPD populations given that shame and self-deprecation also have a defining role in the development of BPD pathology. While individuals with BPD experience a range of intense negative emotions, Crowe (2004) has described BPD as a shame disorder, with the various behaviours related to BPD overlapping with the characteristics of an extreme shame response: affective instability, anger outbursts, abandonment fears and emptiness. Consistently, BPD has been correlated with higher levels of shame-proneness as well as prolonged, intense shame responses compared to healthy controls and individuals with MDD and social phobia (Scheel et al, 2013; Gratz, Rosenthal, Tull, Lejuez, & Gunderson, 2010; Rusch et al., 2007). Scheel et al. (2013) developed standardized stories to measure shame reactivity and found higher baseline levels of sadness and shame in BPD compared to individuals with MDD and healthy controls. In a study by Gratz et al. (2010), participants 1) performed a laboratory task known to elicit anxiety, irritability and frustration and then 2) received negative feedback. BPD participants demonstrated increased reactivity to negative evaluation, but not in response to the general stressor of completing the laboratory task. Indeed, individuals with BPD only had higher shame and a more prolonged shame response than controls in response to the negative feedback

portion, suggesting that emotional reactivity in BPD may be specific to and occur in the context of a shame response. Furthermore, shame appears to be integrated into the self-concept of individuals with BPD. Using an implicit association paradigm, Rusch et al. (2007) found that individuals with BPD were more rapid in categorizing word pairings that implied associations between the self and shame versus pairings with other emotions like anxiety. Overall, individuals with BPD had higher explicit or self-reported levels of shame and stronger implicit associations between the self and shame, in comparison to socially phobic and healthy women. Higher scores on shame-related indices were also associated with lower self-esteem and quality of life and anger.

Shame proneness has been found to predict SII in BPD (Brown, Linehan, Comtois, Murray & Chapman, 2009). Brown et al. (2009) measured emotional states before and after an interview about recent events that triggered a SII, using observer and self-report ratings on the Positive and Negative Affect Schedule (Watson & Clark, 1988) and a behavioural measure of shame, the Emotion Facial Affect Coding System (Ekman & Friesen, 1975, 1978). Across all indices, higher expression of shame during the interview was associated with at least twice the risk of future SII. However, shame did not predict SII when controlling for fear. The authors explained this result by suggesting that it may be the fear of rejection elicited by shame that leads to action tendencies such as SII.

SII often functions as self-punishment and the regulating nature of self-punishment among individuals with BPD has been examined in a study by Rosenthal, Cukrowicz, Cheavens and Thomas (2006). The Thought Control Questionnaire (Wells & Davies, 1994), which assesses various methods used to regulate aversive experiences

(e.g. cognitive reappraisal, worry, self-punishment, etc.), was administered to individuals with BPD, psychiatric conditions that frequently co-occur with BPD (i.e. depression and other personality disorders) and healthy controls. Individuals with BPD were significantly more likely to endorse using self-punishment to regulate their experience compared to the other participant groups and self-punishment accounted for a unique portion of the variance in BPD severity, even after accounting for negative affectivity. Hence, higher levels of self-punishment appear to be a distinguishing feature of BPD, which is consistent with a propensity to engage in negative self-evaluation and SII.

In light of the contribution of experiential avoidance of emotions, such as shame to engagement in SII, DBT treatment for individuals with suicidal BPD has been developed to enhance individuals' ability to tolerate and effectively engage with negative emotions rather than escape.

Dialectical Behaviour Therapy

DBT is the gold standard treatment for SII among individuals with BPD. Traditional DBT is a comprehensive treatment package delivered over the course of 12 months (Linehan et al., 1991). Each week, participants attend individual therapy and didactic group training in DBT skills (i.e. mindfulness, distress tolerance, emotion regulation, interpersonal effectiveness) and therapists support patients with *in vivo* skill implementation through phone consultation. Supervision of DBT therapists is also provided in a systematic way with weekly team meetings and ongoing case consultation with an advanced DBT therapist (Linehan et al., 1991). Together, the treatment team provides continuous, hands on support to help individuals with BPD develop strategies that prevent and manage SII and other target behaviors.

DBT has been found in several randomized controlled trials (RCT) to be effective in reducing SII (Koons et al., 2001; Linehan et al., 1991; Linehan et al., 2006; Verheul et al., 2003; McMain et al., 2009), hopelessness (Koons et al., 2001), depression at post-treatment (Koons et al., 2001, McMain et al., 2009) and one-year follow-up (McMain et al, 2012), anger regulation (Koons et al., 2001; McMain et al., 2009) and healthcare service use (McMain et al., 2009; Linehan 1991, 2006). Notably, in an RCT of comprehensive DBT, increases in the use of DBT skills fully mediated improvements in SAs, depression and anger regulation and partially mediated the reduction in NSSI (Neacsiu, Rizvi & Linehan, 2010). Given the significant role of DBT skills development on clinical improvements following DBT, recent efforts to reduce costs and reach a larger number of individuals has led to investigations of the effectiveness of DBT skills training (DBT-ST) on its own.

The effectiveness of DBT-ST has been examined in a number of clinical populations including individuals with BPD. Soler and colleagues (2009) compared various clinical changes over the course of 13 weeks of DBT-ST versus standard group therapy (SGT) in a sample of BPD outpatients. Relative to SGT, DBT-ST yielded significantly larger reductions in irritability, psychoticism, impulsivity, affective instability and anger. Although larger reductions in suicide were found in the DBT-ST group post-treatment, this change was not significantly larger than the reduction observed in the SGT group**.** Harley, Baity, Blais and Jacobo (2007) examined DBT-ST in conjunction with DBT and non-DBT individual therapy in a non-randomized study. Significant within-group reductions in BPD severity, depression and suicidality were found in both treatment conditions while between-group analyses were non-significant.

The non-DBT individual therapy condition in this study is consistent with services received by individuals in treatment as usual (TAU), suggesting that DBT-ST plus TAU may be comparable to the more comprehensive and expensive approach of combining DBT individual therapy with DBT-ST.

In sum, the effectiveness of comprehensive DBT in treating BPD is well-established; yet, similar outcomes found in DBT-ST research suggests that clinical improvements following comprehensive DBT might be primarily accounted for by the skills training component rather than other components of DBT, such as individual therapy. However, hundreds of skills are taught in DBT and at present, little is known about which "candidate" skills are primarily responsible for obtaining therapeutic outcomes, particularly, reductions in SII. Hence, an important step in the effort to further identify the active therapeutic elements of DBT requires a more nuanced examination of the effect of specific DBT skills on the frequency of SII. Mindfulness, as an orientation of acceptance toward experience, is both a skills module and a general approach that permeates the spirit of instruction in all DBT skills. Hence, the current study examined the cultivation of mindfulness as a mechanism accounting for change in SII following DBT-ST.

Mindfulness

Mindfulness is a natural place to begin dismantling the mechanisms of DBT-ST. It is the first and the most fundamental of the skills taught in DBT and, conceptually, mindfulness is reciprocal to the emotional escape and harsh self-judgments that are linked to SII. Mindfulness skills have also been reported to be among the most frequently used, effective and helpful of the DBT skills (Lindenboim, Comtois, Linehan, 2007; Miller,

Wyman, Huppert, Glassman, & Rathus, 2000).

Conceptualizations of mindfulness vary throughout the literature, but reviews of existing theories suggest that mindfulness typically consists of two components: present-centered attention and a non-judgmental attitude (Bishop et al., 2004; Williams, Teasedale, Segal, & Kabat-Zinn, 2007; Farb, Anderson, Irving Segal, 2014). Present-centered attention (PCA) means being fully immersed in the present moment. In order to do so, one must observe the details of one's internal and external environment while refraining from mental elaboration or manipulation that pulls attention away from one's immediate experience. Rather, experiences are allowed to arise and pass naturally without being actively distorted (Farb et al., 2014). The second component of mindfulness is a nonjudgmental (NJ) attitude, in which experience is seen as neither good nor bad (Farb et al., 2014). An attitude of non-judgment requires acceptance of and willingness to experience a stimulus regardless of its valence, as well as decentering, which can be thought of as observing oneself in an objective way (Farb et al., 2014). Decentering facilitates an awareness that one's perceptions are subjective and do not necessarily reflect absolute truths about oneself or the world (i.e. thoughts are not facts). Through decentering, habitual evaluations of oneself or situations can be suspended and give way to new, healthy ways of responding in place of behaviours such as SII.

In DBT, the practice of mindfulness is taught as a set of "what" and "how" skills (Linehan, 1993). The "what" skills, which refer to "what" one is doing when in a mindful state, include *observing* experience without attempting to act on or engage with it (e.g. watching a negative feeling arise and pass without responding with secondary thoughts or actions), *describing* the nature of one's experience in words (e.g. putting words onto the

experience, such as "I feel sad") and *participating* in experience (e.g. fully immersing oneself into the experience, as a dancer becomes one with his or her movement; Linehan, 1993). The "how" skills describe the nature of a mindful attitude and orientation to experience. The experience that is being observed, described or participated in is not evaluated as either good or bad (*nonjudgmentally*), is taken up as the single focus of attention (*one-mindfully*) and is approached pragmatically in service of one's goals (*effectively*; Linehan, 1993). Breaking down mindfulness into these component skills makes the process of acquiring mindfulness skills simpler and more concrete for individuals with emotion dysregulation (Linehan, 1993).

Across all definitions and instructions, mindfulness involves being fully engaged in the moment, without judging, identifying, avoiding or becoming too "caught up" in the content of one's experience. By facilitating awareness instead of escape, and nonjudgment instead of shame and self-deprecation, mindfulness is antithetical to core processes believed to maintain SII.

Mindfulness, Experiential Avoidance, and Shame

The inverse relationship between mindfulness and experiential avoidance is well-documented (Feldman, Hayes, Kumar, Greeson & Laurenceau, 2004; Bowen et al., 2009; Hayes, Luoma, Bond, Masuda & Lillis, 2006; Williams, Teasdale, Segal, & Soulsby, 2000; Bond & Bunce, 2000). Mindfulness is believed to promote a more balanced form of cognitive and emotional awareness by preventing both under-engagement (i.e. avoidance) and over-engagement with thoughts and emotions. Feldman, Hayes, Kumar, Greeson & Laurenceau (2004) examined correlates of mindfulness in an undergraduate sample and found that higher levels of mindfulness were associated with less experiential

avoidance and less thought suppression. In addition, reductions in experiential avoidance have been noted following interventions that include mindfulness training (Bowen et al., 2009; Hayes, Luoma, Bond, Masuda & Lillis, 2006; Williams, Teasdale, Segal, & Soulsby, 2000). Following a mindfulness-based relapse prevention program for substance abusers, Bowen et al. (2009) found post-intervention improvements in substance use were accompanied by increases in mindfulness and acceptance and decreases in attempts to avoid or control negative experiences. Reductions in experiential avoidance have also been found to mediate decreases in workplace-related stress following a mindfulness-based therapy (Bond & Bunce, 2000). Improved recall of autobiographical memories following Mindfulness-Based Cognitive Therapy (MBCT) for depression also suggests that mindfulness training facilitates present-centered attention and may reduce suppression of memories (Williams, Teasdale, Segal, & Soulsby, 2000).

Although not directly examined in relation to shame, mindfulness has been linked to lower levels of negative self-evaluation. Feldman, Hayes, Kumar, Greeson & Laurenceau (2004) found that college students with higher levels of self-reported mindfulness were less likely to make negative generalizations about themselves based on discrete experiences of failure. The ability to suspend attributions or generalizations about the self based on one's experiences is believed to be a natural consequence of decentering, one mechanism by which mindfulness may reduce shame-proneness and improve self-concept (Lynch, Chapman, Rosenthal, Kuo & Linehan, 2006). Decentering, and the objective relationship to internal experiences that it embodies, has been found to increase following MBCT for depression. In a RCT comparing MBCT to standard care for depression (i.e. primary care visits), Teasdale and colleagues (2002) found that

depressed individuals who received MBCT adopted a more objective awareness of their negative thoughts and feelings. Similarly, in an RCT comparing MBCT with anti-depressant medication, Bieling and colleagues (2002) found increases in decentering in the MBCT group, but not in individuals who received anti-depressant medication only. Finally, mindfulness may reduce shame by increasing self-compassion. A fundamental part of self-compassion involves recognizing that pain is part of the human experience and responding to imperfection and suffering with sensitivity and kindness rather than harsh judgment (Neff & Germer, 2013). Thus, the cultivation of mindfulness, which involves an awareness and acceptance of the totality of one's experience including pain and imperfection, is a prerequisite for the development of self-compassion (Neff & Germer, 2013). Mindfulness training in the form of MBCT has been associated with significant increases in self-compassion. Indeed, by facilitating decentering and self-compassion, mindfulness may reduce negative self-evaluations and SII.

Mindfulness, BPD and SII

As previously discussed, mindfulness is a core component of DBT and the acquisition of mindfulness skills by individuals with BPD is theorized to have an effect on the frequency of engagement in SII by reducing avoidance of negative emotions such as shame (Chapman et al., 2006; Wupperman, Fickling, Klemanski, Berking & Whitman, 2013; Brown et al., 2009). However, only recently has the direct relationship between mindfulness and BPD been explored. Three studies have examined present-centered awareness (one aspect of mindfulness) in relation to BPD features. In a student sample, Wupperman, Neumann and Axelrod (2008) examined the relationship between mindfulness, BPD features, and behavioural difficulties. A significant negative

relationship was found between mindfulness and BPD features, even when controlling for well-established predictors of BPD such as neuroticism, emotion regulation strategies and interpersonal effectiveness. These relationships were successfully replicated in a sample of psychiatric inpatients (Wupperman et al., 2009). Only one study has examined the relationship between BPD features, mindfulness and NSSI. Psychiatric inpatients completed measures of mindfulness and were asked to report how they would cope with an imaginary distressing situation. Individuals with more severe BPD features were more likely to report that they would use NSSI to cope with the imagined situation, and a lack of mindfulness significantly accounted for this relationship (Wupperman et al., 2013). While this research provides encouraging support for the relationship between present-centered awareness, BPD, and SII, as previously discussed, mindfulness is a multi-componential construct, consisting of present-centered awareness and non-judgment. Given the strong evidence linking shame and self-judgment to the etiology of SII (e.g. Brown et al., 2009), the limited research aiming to delineate the specific relationships between nonjudgement, BPD, and SII is a notable gap in the literature.

Mindfulness Skills and DBT

In DBT, as previously mentioned, the practice of mindfulness is taught as a set of skills. The Kentucky Inventory of Mindfulness Skills (KIMS; Baer et al., 2004) is a multi-dimensional measure of mindfulness skills derived largely from the DBT-based operationalization of mindfulness. The four subscales of the KIMS assess five of the six DBT mindfulness skills (all but effectiveness): *observe*, *describe*, *act with awareness* (corresponding to "participating" and "one-mindfully") and *accept without judgment* (corresponding to "nonjudgmentally"). Studies examining the psychometric properties of

the KIMS have found that the skills of *describing*, *acting with awareness*, and *accepting without judgment* are significantly correlated with indices of well-being and are significantly lower in BPD samples compared to student and community samples (Nicastro, Jermann, Bondolfi & McQuillan, 2010; Baer, Smith & Allen, 2004). However, the skill of *observing* did not significantly differ between BPD, student, and community samples and had either no correlation or a negative correlation with indices of psychological functioning (Nicastro et al., 2010; Baer, Smith & Allen, 2004; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). These differing findings for the KIMS subscales are consistent with research suggesting that the total score for the KIMS may not represent one underlying dimension but rather a dimension related to awareness (*observe, describe and acting with awareness)* and a second dimension of acceptance without judgment (Coffey, Hartman & Frederickson, 2010). Notably, the skill of *acceptance without judgment* may be the most significant deficit among individuals with BPD, with mean scores on this skill being the lowest of the four skills and differing most from student and community samples (Nicastro et al., 2010; Baer et al., 2004). The construct of *acceptance without judgment* demonstrates good validity, correlating negatively with measures of experiential avoidance, depression and symptom distress in BPD samples (Nicastro et al., 2010). Nicastro et al. (2010) examined changes in mindfulness skills pre and post an abbreviated form of comprehensive DBT or "intensive DBT" (I-DBT). I-DBT includes a total of 4 hours of individual therapy, 12 hours of DBT skills training and ad hoc phone consultation over the course of four weeks. All four facets of the KIMS increased following I-DBT suggesting that intensive DBT intervention increases mindfulness skills. However, the presence of BPD behavioural difficulties were not

measured post-treatment thus precluding any examination of the therapeutic effect of mindfulness skills on BPD behavioural difficulties such as SII. In a follow-up study by Perroud, Nicastro, Jermann and Huguelet (2012), participants received 4 weeks of I-DBT followed by 10 months of modified comprehensive DBT. This modified version included phone consultation only within business hours and skills training modules were offered on as needed basis, such that certain individuals may only have received a selection of modules. Perroud and colleagues (2012) looked at whether each component of KIMS mindfulness increased in I-DBT, increased again during the subsequent comprehensive DBT and whether increases in mindfulness correlated with decreased BPD severity. They found that no significant increase in any facet except *accept without judgment* after controlling for confounds such as depression and hopelessness and *accept without judgment* was also associated with improvements in BPD severity. Although these findings were no longer significant after correcting for multiple tests, this work by Perroud et al. (2012) suggests that *acceptance without judgment* may have a unique relationship with BPD pathology compared to the other facets of mindfulness.

Study Objectives and Hypotheses

In sum, SII in BPD represents a significant health issue with a high human and economic cost (Zanarini et al., 2005, 2008). While DBT-ST is effective in reducing SII, it has yet to be determined what specific mechanisms of the treatment can account for improvements in SII. Theoretically, mindfulness is a candidate mechanism that is theorized to impact engagement in SII by reducing avoidance of intense emotions such as shame. However, there are a number of gaps in the literature linking mindfulness skills and SII among individuals with BPD (Wupperman et al., 2008, 2013). To date, only the

awareness component of mindfulness and NSSI have been assessed in relation to "BPD features." Furthermore, no study has examined whether increases in mindfulness skills over the course of DBT account for reductions in SII. Indeed, formally measuring the therapeutic contribution of DBT mindfulness skills is critical to informing the development of more streamlined and cost effective treatments for SII.

The current research addressed the gaps in the extant literature by 1) examining the relationship between different dimensions of mindfulness and SII in a sample of suicidal individuals with a diagnosis of BPD and 2) examining whether changes in specific dimensions of mindfulness account for changes in SII after 20-weeks of DBT-ST among suicidal individuals with BPD. Given the theoretical role of shame and negative self-evaluations in conferring risk for SII, it was hypothesized that 1) *acceptance without judgment* will uniquely predict frequency of SII above and beyond the other components of mindfulness and (2) *acceptance without judgment* will uniquely mediate reductions in the frequency of SII over the course of DBT, when controlling for the other components of mindfulness. Clinically-relevant behaviours empirically linked with SII, such as BPD severity, MDD and history of SII were included as covariates in all analyses. In addition, as female gender is more highly correlated with constructs related to nonjudgment such as shame-proneness, gender will be included as a covariate (Tangney, 1990).

Method

This study was completed as part of a larger randomized-clinical trial examining the clinical and cost-effectiveness 20 weeks of DBT-ST at the Borderline Personality Disorder Clinic at the Centre for Addictions and Mental Health (CAMH) in Toronto.

Participants

Participants (N=84) were recruited through treatment and research waiting lists at CAMH and advertisements placed in various health centers in Toronto and the surrounding areas. A pre-screening interview was conducted by phone with a research associate who provided relevant information about the study including the randomization procedure and preliminary questions to assess eligibility. All participants were required to meet full criteria for Borderline Personality Disorder and have engaged in a minimum of two prior incidents of SII, suicidal or non-suicidal, in the last 5 years, one of which must have occurred in the 10 weeks prior to study screening. Enrolment was limited to individuals with English proficiency who were between the ages of 18 and 60. Age limitations were put in place to ensure consistency with both the *Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition* (DSM-IV) criteria for BPD, which requires a minimum age of 18, and research suggesting that BPD criteria diminish significantly with age (Paris & Zwieg-Frank, 2001).

Personality disorder symptomatology was assessed using the *International Personality Disorder Exam – BPD Module* (IPDE-BPD; Loranger, A. W., 1995). The IPDE is a commonly used semi-structured interview of personality disorder based on the World Health Organization (WHO) classification system (Loranger, Janca, Sarlorius, 1997). The presence of traits and behaviours related to BPD are assessed through a series of open-ended questions and a rating is assigned of 0 (absent or normal), 1 (exaggerated

or accentuated), or 2 (pathological). For a diagnosis of BPD to be assigned, a minimum of five symptoms must have been present over the past 5 years including one that was present before the age of 25 (Loranger, Janca, Sarlorius, 1997). In a large cross-cultural validation study conducted by the WHO, the IPDE demonstrated high temporal stability over an average of six months, inter-rater agreement and agreement with DSM-III diagnoses of BPD (92%; Loranger et al., 1994).

The *Lifetime Suicide Attempt – Self-Injury Interview* (L-SASII; previously Lifetime Parasuicide Count; Linehan & Comtois, 1996) was administered at baseline to assess the total frequency of NSSI and SAs over the lifespan. The L-SASII is lifetime version of the Suicide Attempt Self-Injury Interview (SASII), which has good interrater reliability (.85-.93; Linehan, Comtois, Brown, Heard & Wagner, 2006) and has been used in numerous treatment trials to assess SII (Linehan et al., 1991; Linehan et al., 2006; McMain et al., 2009; Verheul, 2003). The L-SASII queries participants about the details of their first SII and their most recent event including the nature of their intent (non-suicidal, ambivalent suicidal or suicidal), the environmental consequences (e.g. "What happened next?") and the medical treatment they received.

Participants who had received DBT skills group treatment in the past six months were excluded, however, all participants were permitted to continue with all other treatment-as-usual (TAU) such as doctors visits, pharmacological treatment and other co-occurring therapies other than DBT. Finally, a small number of exclusion criteria were implemented that might interfere with a participant's ability to engage with and understand the treatment being offered. The exclusion criteria and measures were as follows:

(a) presence of DSM IV psychotic disorders, bipolar disorder I and dementia. The *Structured Clinical Interview for the Diagnostic and Statistical Manual-IV, Axis I, Patient Version* (SCID-I; First, Spitzer, Gibbon & Williams, 2002) was used to assess the presence of DSM-IV Axis I disorders, including anxiety, depressive, bipolar, psychotic, substance use, eating, obsessive-compulsive and trauma-related disorders. The SCID-I is a semi-structured interview with moderate to excellent inter-rater reliability with kappa values for Axis I modules ranging from .60 to .83 (Lobbestael, Leurgans & Arntz, 2011).

(b) presence of an organic brain disorder or mental retardation. The *Peabody Picture Vocabulary Test-Revised* (PPVT-R; Dunn, 1981) was used to determine whether participants' general intellectual functioning was sufficient to enter the study (i.e. IQ greater than or equal to 70.4). The PPVT-R is a commonly used screening measure for general verbal cognitive ability in which the participant is required to examine a group of pictures and identify the correct depiction of a stimulus named by the test administrator (Golden, Espe-Pfeifer, Wachsler-Felder, 2000). The PPVT-R has evidenced good alternate form reliability, good split-half reliability (r = .82) and scores are highly correlated with the Weschler Adult Intelligence Scale – Revised (Stevenson, 1986; Franzen, 2002).

Procedure

Randomization. Eligible participants read and signed the consent form before entering the trial and were then randomly assigned to the waiting list plus treatment as usual or to DBT-ST plus treatment as usual. They were informed of their trial condition (i.e. wait-list or DBT-ST) and visited the clinic prior to beginning treatment to complete

various outcome measures. Treatment outcome measures were re-administered at 10 weeks, at 20 weeks and at 8 months.

20-Week DBT Skills Training. Prior to commencing the DBT-ST, each participant attended a 90 minute individual orientation session with a study therapist. This session was aimed at enhancing commitment to treatment and providing information about the format and expectations of group treatment. DBT-ST is an abbreviated 20 week version of the original 12 month treatment outlined in the DBT manual (Linehan, 1993). Key skills from each of the four original skills modules (i.e. mindfulness, emotion regulation, distress tolerance, interpersonal effectiveness) were included in addition to a new skills module on dialectics, which are strategies to facilitate balanced rather than polarized thinking (Miller, Rathus, Linehan; 2007).

The treatment consisted of one weekly two-hour group session where participants were instructed in the use of DBT skills. Each module was taught over 4 consecutive weeks except mindfulness, which consisted of single sessions at the beginning of each module. In between weekly sessions, participants completed homework to enhance their acquisition of new skills such as tracking their behaviours using diary cards and completing readings.

DBT-ST was administered by two psychiatrists and five therapists with a minimum of master's level training in psychology or social work. Each therapist had a minimum of 5 years of experience with DBT and had participated in DBT training workshops. To ensure treatment fidelity, ad hoc and formal weekly supervision were provided to therapists by the principal investigator of the larger study, a clinical psychologist with extensive clinical and research experience with DBT.

Measures

A *modified L-SASII* was used to monitor changes in SA and NSSI over the course of the trial. Rather than the first ever or most recent SII, the format of the L-SASII was used to assess the most severe incident of SII over the past 10 weeks. Detailed information was also be obtained regarding total frequency and method of SII and of medical treatment over the 10 week period.

The *Kentucky Inventory of Mindfulness Skills* was used to assess mindfulness (KIMS; Baer, Smith & Allen, 2004)**.** The KIMS includes four subscales developed based on the four mindfulness skills taught in dialectical behaviour therapy: (1) *Observing* internal and external stimuli, (2) *Describing* or applying words to stimuli in a nonjudgmental way, (3) *Acting with awareness* by being fully immersed in one's current activity, (4) *Accepting without judgment* by allowing one's experience to be just as it is rather than attempting to change or escape it. Scores on each subscale can be used to determine deficits in specific areas of mindfulness or total scores can provide a general assessment but psychometric testing suggests that the KIMS does not reflect a single underlying dimension and that subscales scores may be more useful in isolation. The primary subscale of interest in this study, *accepting without judgment*, correlates negatively with the Beck Hopelessness Scale (-.20), the Beck Depression Inventory (-.27), Global Severity Index (-.37) and the Positive Symptom Distress Index (-.34) in a BPD sample (Nicastro et al., 2010). In BPD samples, the KIMS has also had very good test-retest reliability over a two week period but also demonstrates sensitivity to change over four weeks of DBT (Nicastro et al., 2010).

Potential Covariates. The *Borderline Symptom List-23* (BSL-23; Bohus et al., 2009) was included as a potential time-varying covariate for all analyses. It consists of 23 items measuring borderline symptoms experienced in the last week on a scale from 0 (not at all) to 4 (very strong) with higher scores indicating more severe borderline symptoms. Items are based on the DSM-IV criteria for BPD and represent seven subscales: self-perception, affect regulation, self-destruction, dysphoria, loneliness, intrusions and hostility. The BSL-23 has high internal consistency and test-retest reliability over a 1 week period (Bohus et al., 2009).

The *Beck Depression Inventory-II* (BDI-II; Beck, Steer, Brown, 1996) was included as a potential time-varying covariate for all analyses. The BDI-II is a 21-item measure of depressive symptoms over the past two weeks. Items are assessed on a 4 point scale from 0 to 3 and total scores provide an index of minimal, mild, moderate or severe depression. Each question reflects the spectrum of severity beginning with the mildest (e.g. “I do not feel sad”) to the most severe manifestation of a given symptom (e.g. “I am so sad or unhappy that I can't stand it”). The BDI-II has yielded a high level of internal consistency with an average cronbach’s alpha of 0.91 across 13 studies (Dozois & Colvin, 2004). In addition, the BDI-II demonstrates a high level of convergence with other measures of depression and constructs related to depression such as self-esteem, anxiety and stress (Osman et al., 1997). The BDI-II has been used extensively to measure depression in BPD (e.g. Berking, Neacsiu, Comtois & Linehan, 2009).

Analytic Strategy

Hypothesis 1. The hypothesis that *accepting without judgment* uniquely accounts for variance in SII above and beyond the other mindfulness dimensions at baseline was tested using a series of regression models. Total scores for each of the KIMS subscales were entered as predictors of the total number of incidents of NSSI and SA on the L-SASII at pre-treatment baseline. Two regression models were constructed- one each for NSSI and SAs – with each of the four KIMS subscales entered simultaneously as predictors. A negative binomial distribution was modeled to account for the over dispersion in the count outcomes for total NSSI and SA (Cameron, 2012).

Hypothesis 2. The hypothesis that *accepting without judgment* explains a greater indirect effect on changes in the frequency of NSSI and SA over 20 weeks of DBT relative to the other dimensions of mindfulness was tested using a causal mediation analysis (Hayes, 2009). To establish *change in total mindfulness and each of the four mindfulness subscales* (referred to collectively as mindfulness for the remainder of the analytic strategy section) as mediators of change in NSSI/SAs, the following four relationships must be present: a significant total effect of treatment on NSSI/SA, a significant effect of treatment on change in mindfulness, a significant effect of mindfulness on NSSI/SA when controlling for treatment, and a non-significant direct effect of treatment on NSSI/SA when controlling for mindfulness (Fritz & MacKinnon, 2007).

The causal mediation analysis was carried out in three steps. In step 1, an estimate of the total effect of treatment on NSSI/SA at the end of treatment was obtained using a generalized linear model with treatment as the predictor. A negative binomial distribution

was used due to the over-dispersed nature of the count outcomes (Cameron, 2012). In step 2, an estimate of the effect of treatment on *change in mindfulness* was obtained using a linear regression model. In step 3, a negative binomial regression model predicting NSSI/SA from both treatment and mindfulness was estimated. Specifically, the effect of mindfulness on NSSI/SA was estimated while controlling for treatment condition and the effect of treatment on NSSI/SA was estimated while controlling for mindfulness (i.e. the direct effect of treatment).

Lastly, the significance of the indirect effects of treatment condition on NSSI through mindfulness was assessed by drawing 5000 bootstrap samples and examining the 95% bias corrected confidence intervals (Fritz & MacKinnon, 2007). Bias corrected bootstrapping has been shown to have the most power to detect a significant mediating effect. If the indirect effect is significant, while the direct effect of treatment on NSSI from step 1 becomes non-significant in step 3, then we conclude the intervening variable (i.e. mindfulness) is a mediator. Due to the small sample size, it was not possible to include all covariates that were initially proposed such as BPD severity and gender. However, only BDI and age differed between the treatment conditions at baseline and these variables were includes as covariates at each step of the analysis. All analyses were conducted using R 3.0.1.

Results

Descriptive Statistics

Descriptive statistics and significance tests were calculated for all demographic and baseline measurements and can be found in Tables 1 to 3. Between treatment group differences were examined with the use of independent samples t-tests for continuous variables (age and income) and chi-square tests for categorical variables (sex, education, employment status, marital status, number of children). No significant differences between the groups were found at baseline for demographic variables, with the exception of age (WL: M=32, SD=9.15; DBT: M=27.3, SD=7.52; p=0.01). Therefore, age was included as a covariate in all subsequent analyses.

Table 1
Participant Demographics by Condition

Demographic	WL	DBT	p-value
N	42	42	
Age	32.0 (±9.15)	27.3 (±7.52)	0.01
Sex			0.43
Male	11 (26.2%)	7 (16.7%)	
Female	31 (73.8%)	35 (83.3%)	
Education			0.44
Less Than High School	1 (2.38%)	4 (9.52%)	
High School	3 (7.14%)	5 (11.9%)	
Some College or University	17 (40.5%)	13 (31.0%)	
>= College degree	21 (50.0%)	20 (47.6%)	
Employment			0.40
Unemployed	10 (23.8%)	10 (23.8%)	
On Public Assistance/Disabled	11 (26.2%)	13 (31.0%)	
Student	3 (7.14%)	8 (19.0%)	
Part-Time Employed	4 (9.52%)	2 (4.76%)	
Full-Time Employed	14 (33.3%)	9 (21.4%)	
Marital status			0.18
Single/Divorced/Widowed	30 (71.46%)	36(85.74%)	
(Re)Married/Separated	12 (28.55%)	6 (14.28%)	
Children			0.58

0	33 (78.6%)	36 (85.7%)	
>=1	9 (21.4%)	6 (14.3%)	
Income	12,600$ [626; 33,750]	10,500$ [5; 29,500]	0.28
BDI-II	37.5 (±11.3)	32.4 (±10.6)	0.04
BSL-23	58.6 (±18.6)	55.1 (±16.9)	0.37
KIMS	105 (±15.7)	102 (±18.6)	0.45
NSSI	10.0 [2.00; 20.0]	5.00 [3.00; 18.0]	0.90
SA	0.00 [0.00; 1.00]	0.00 [0.00; 1.00]	0.75

Note: WL = Waitlist, DBT = Dialectial Behaviour Therapy Skills Training, BDI = Beck Depression Inventory II, BSL-23 = Borderline Symptom List 23, KIMS = Kentucky Inventory of Mindfulness Skills, NSSI = Nonsuicidal Self-Injury and SA = Suicide Attempts.

Variables represented as mean (± standard deviations), median [IQR], or frequencies (percentages).

Table 2

Lifetime Diagnostic Comorbidities as Totals and Percentages

Diagnosis	DBT	WL	Full Sample	p-value
Major depressive disorder	18 (42.9)	17 (40.4)	35 (41.7)	0.83
Panic disorder	2 (4.8)	3 (7.1)	5 (6.0)	0.65
Post-traumatic stress disorder	5 (11.9)	6 (14.3)	11 (13.1)	0.75
Any anxiety disorder	23 (54.8)	24 (57.1)	47 (56.0)	0.83
Substance abuse	4 (9.5)	2 (4.8)	6 (7.1)	0.40
Substance dependence	11 (26.2)	13 (31.0)	24 (28.6)	0.63
Any eating disorder	2 (4.8)	3 (7.14)	5 (6.0)	0.65

Note. DBT = dialectical behaviour therapy, WL = waitlist.

Table 3

Current Diagnostic Comorbidities as Totals and Percentages

Diagnosis	DBT	WL	Full Sample	p-value
Major depressive disorder	23 (54.8)	20 (47.6)	43 (51.2)	0.51
Panic disorder	4 (9.5)	8 (19.1)	12 (14.3)	0.21
Post-traumatic stress disorder	8 (19.1)	11 (26.2)	19 (22.6)	0.43
Any anxiety disorder	21 (50.0)	30 (71.4)	51 (60.7)	0.04
Substance abuse	7 (16.7)	4 (9.5)	11 (13.1)	0.33
Substance dependence	24 (57.1)	23 (54.8)	47 (56.0)	0.83
Any eating disorder	5 (11.9)	8 (19.1)	13 (15.5)	0.37

Note. DBT = dialectical behaviour therapy, WL = waitlist.

Missing Data

Out of 84 participants, the NSSI and the KIMS subscales contained between 10-16 missing data points at the end of treatment. Due to the limited sample size, an

imputation method was used. Participants with missing NSSI at the end of treatment had their NSSI scores at the 10 week mark imputed for the outcome (i.e., their 10 week KIMS scores were used to estimate the KIMS change scores). Median imputation of NSSI at the end of treatment was used for 6 participants without 10-week KIMS scores. There was a linear downward trend from baseline to the end of treatment hence the imputing the 10 week scores provided a conservative estimate of the treatment effect.

Tests of Hypothesis 1: Acceptance without judgment will uniquely predict frequency of SII above and beyond the other components of mindfulness.

At baseline, none of the KIMS *subscales* or *total* scores were significantly associated with NSSI: KIMS *describe* (β=-0.01, z=-0.58, *p*=0.56), KIMS *acting with awareness* (β=-0.05, β=-1.23, *p*=0.22), KIMS *acceptance without judgment* (β=0.02, z=0.66, *p*=0.51), KIMS *observe* (β=0.01, z=0.81, *p*=0.42), and KIMS total (β=0.001 z=0.18, *p*=0.86). Similarly, there was no significant relationship between on SA for the KIMS *observe* subscale (β=0.04, z=1.29, *p*=0.20), *acting with awareness* subscale (β =-0.01, z=-0.16, *p*=0.87), *acceptance without judgment* subscale (β=0.01, z=0.27, *p*=0.79), and KIMS total scale (β=0.03, z=1.64, *p*=0.10). The KIMS *describe* subscale approached significance (β=0.07, z=1.85, *p*=0.06).

Tests of Hypothesis 2: Acceptance without judgment will uniquely mediate reductions in the frequency of SII over the course of DBT, when controlling for the other components of mindfulness.

There was no significant effect of treatment on suicide attempts so a mediation analysis was not performed (β=-0.46, z=0.45, *p*=0.65).

A significant effect of treatment condition on NSSI was found in step 1 of the mediation analysis (β=-1.22, z=2.21 *p*=0.04); patients in DBT had lower rates of NSSI at post-treatment compared to individuals on the waitlist. In step 2, DBT was significantly associated with change in KIMS *acceptance without judgment* subscale (β=3.83, t=2.28, *p*=0.03) and total KIMS change scores (β=8.51, t=2.28, *p*=0.03). Step 3 of the mediation analysis showed that, after controlling for change in KIMS *acceptance without judgment* score, the effect of treatment on NSSI was no longer significant (β= 0.51, z=1.31, *p*=0.19), as was the treatment effect when controlling for total KIMS change score (β=0.20, z=0.28 *p*=0.67). The step 3 models indicated that an increase in KIMS *acceptance without judgment* change scores was associated with a decrease in NSSI at the end of treatment (β=-.10, z=-3.50, *p*<0.001). Change in the KIMS *acceptance without judgment* subscale was a significant mediator of the effect of DBT on NSSI at the end of treatment (Indirect effect=-12.85, 95% CI= (-51.27, -0.45)) and mediated 63.3% of the direct effect of treatment on NSSI. None of the other KIMS subscales mediated the effect of DBT on NSSI at the end of treatment. This mediation is depicted in Figure 1. None of the other KIMS subscale change scores had significant associations with NSSI at the end of treatment. There was a non-significant effect of DBT associated with change in KIMS the *observe* (β=1.70, t=0.97, *p*=0.33)*, acting with awareness* (β=2.07, t=1.69, *p*=0.10) and *describe* subscale (β=0.54, t=0.52, *p*=0.61). When controlling for treatment, the effect of change in *observe* (β=0.0004, z=0.01, *p*=0.99)*, acting with awareness* (β=-0.01, z=-0.31, *p*=0.75) and *describe* subscale (β=0.05, z=0.05, *p*=0.32) on NSSI was non-significant, as were the indirect effects of change in KIMS the *observe* (Indirect effect=-

0.09, 95% CI= (-6.96, 6.11)), *acting with awareness* (Indirect effect=-0.35, 95% CI= (-11.43, 11.95)) and *describe* subscale (Indirect effect=1.84, 95% CI= (-2.54, 10.43)).

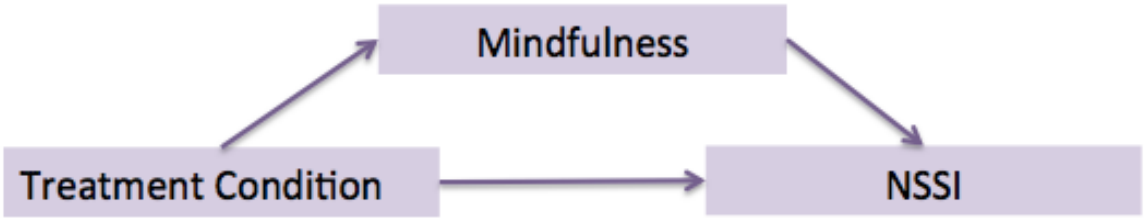

Figure 1. Proposed mediation model.

Discussion

BPD and SII are each associated with mindfulness deficits (Wupperman et al., 2008; 2009; 2013) and teaching mindfulness in DBT is theoretically posited to precipitate reductions in SII (Koons et al., 2001; Linehan et al., 1991; Linehan et al., 2006; Verheul et al., 2003; McMain et al., 2009). However, mindfulness is a multidimensional construct, and little is known about which specific mindfulness dimensions or skills are negatively associated with SII. The present study was the first to directly test (a) the relationship between four mindfulness skills (*Observe, Describe, Acting with Awareness, and Acceptance without Judgment*) and frequency of NSSI and SA among individuals with BPD, and (b) whether changes in mindfulness over the course of DBT predict changes in NSSI and SAs.

The study hypotheses were partially supported. Consistent with hypotheses, findings indicated that increases in *acceptance without judgment* skills accounted for decreases in NSSI over treatment, and that this effect was larger for this facet of mindfulness than others.

Change in Mindfulness During DBT

The hypothesis that treatment would be associated with reductions in NSSI indirectly via increases in *acceptance without judgment* was supported. We expected that *acceptance without judgment* would account for the greatest indirect effect and found that it was the only significant indirect effect of the four mindfulness facets. This finding is consistent with those of Perroud and colleagues (2012) who found that *acceptance without judgment* was the only facet of mindfulness that significantly increased over the course of DBT and that increases in *acceptance without judgment* were accompanied by decreases in BPD severity. Hence, acceptance without judgment seems to have a unique and positive effect on both SII and BPD severity, while other facets of mindfulness have no therapeutic impact. Furthermore, Perroud et al.'s (2012) findings suggest that *acceptance without judgment* is also the most amenable to change during DBT. The positive impact of increasing *acceptance without judgment* on BPD and NSSI is consistent with research suggesting that shame and self-deprecation are core mechanisms leading to the development of BPD and NSSI (Crowe, 2004; Scheel et al, 2013; Gratz, Rosenthal, Tull, Lejuez, & Gunderson, 2010; Rusch et al., 2007).

Contrary to expectations and extant data on DBT, no direct effect of treatment was found for SAs and thus mediation was not tested. This inconsistency might be explained by the fact that, to date, the RCTs that have demonstrated an effect of DBT on suicidality have been for the full DBT treatment package (Koons et al., 2001; Linehan et al., 1991; Linehan et al., 2006; Verheul et al., 2003; McMain et al., 2009). Given that we did not find an effect on SA among a sample of patients in DBT skills only, it may be that the additional modes of telephone consultation and individual therapy may be primarily responsible for DBT's effects on SAs. Although Neacsiu, Rizvi, & Linehan (2010) found

that increases in the use of DBT skills fully mediated improvements in SAs in comprehensive DBT, these findings cannot be solely attributed to the group skills training component of DBT, as the application and use of DBT skills are targeted across all treatment components. Notably, the closest index to SAs that has been measured in a DBT-Skills only treatment (DBT-ST) (Harley et al., 2009) used the suicidal ideation scale of the PAI (Morey, 1991), which does not assess the frequency of SAs as we have done in our study. In this study, Harley and colleagues (2009) found significant decreases in NSSI and suicidal ideation, but despite the fact that these are strong predictors of SAs, Harley et al.'s (2009) study did not examine a direct relationship between DBT treatment and a reduction in SAs. Furthermore, the findings of decreased suicidal ideation and NSSI may not be solely attributable to skills training alone, as clients were also required to be in either individual DBT therapy or some other form of individual therapy. Interestingly, Soler and colleagues (2009) compared the effects of 3 months of standard group therapy and DBT-ST on BPD symptom severity and, consistent with our findings, the authors found no effect of DBT-ST on both NSSI and SAs. Hence, it may be that short-term DBT-ST does not have a significant treatment effect on SAs.

The presence of a treatment effect on NSSI but not SAs, in our study, may also be explained by functional differences between the two behaviours. NSSI can be used to prevent SAs, suggesting that the choice to engage in NSSI rather than a SA can be an adaptive choice at times (Muehlenkamp, 2015; Bracken-Minor & McDevitt-Murphy, 2014; Brown et al., 2003). Hypothetically, we might even expect NSSI and SAs to have a reciprocal relationship under these circumstances. In addition, the most commonly reported function of NSSI is to regulate emotions while SAs are more frequently reported

to function as a means of escape and relieving the burden of other people (Brown et al., 2003). Hence, SAs have a stronger interpersonal component than NSSI, with research suggesting that suicide is related to the perception of being a burden and being rejected by others (Joiner, Ribeiro, Silva, 2012). Specifically, Brown et al.'s (2003) study found that "to make others better off" was the primary function for SAs among women with BPD while affect regulation was the primary function for NSSI. Thus, it seems that NSSI is focused on regulating internal affective experiences while SAs are primarily intended to regulate the experiences of others. This is particularly relevant because the hierarchy of treatment targets in DBT-ST prioritizes developing adaptive skills to regulate emotions whereas individual therapy and phone consultation are highly focused on specific and active problem solving to prevent suicidal behaviors (Linehan, 1993; Soler et al., 2009). Given the evidence suggesting that NSSI serves emotion regulatory functions (Klonsky, 2009; Kamphuis, Ruyling & Reijntjes, 2007; Nock, Prinstein & Sterba, 2009; Briere & Gil, 1998), NSSI might be more directly targeted in DBT-ST whereas SAs might be more explicitly targeted across other modes of the DBT treatment.

Baseline Mindfulness and SII

Contrary to expectations, baseline data did *not* reveal a relationship between mindfulness skills and either NSSI or SAs. In addition, no relationship between DBT-ST and SAs was found.

The study findings did not find support for the hypothesis that mindfulness skills would negatively predict the frequency of NSSI and SAs prior to commencing treatment and that the *acceptance without judgment* facet of KIMS mindfulness would be a stronger predictor of NSSI and SAs than the other three facets (i.e., *Observe, Describe and Acting*

with Awareness). At baseline, we found no relationship between each facet of mindfulness and NSSI. Also contrary to expectations, none of the facets of mindfulness significantly predicted SAs. It is possible that these relations were not found due to the population of study. In the present study, all participants were required to meet criteria for a BPD diagnosis and have engaged in recent SII, defined as a minimum of two prior suicidal or non-suicidal incidents of self-harm in the last 5 years, one of which must have occurred in the 10 weeks prior to study screening. Further, we also assessed the frequency of SII over the past 10 days in the middle and at the end of treatment, making our assessment of SII in BPD much more specific than the general *propensity* for impulsive and self-destructive behaviour measured in the Wupperman and colleagues (2008; 2009; 2013) studies. Thus, it's possible that "BPD features," as measured by the PAI is conceptually distinct from the BPD diagnosis and SII, and therefore, may explain the conflicting findings between the current study and previous research.

Of note, the hypotheses that mindfulness would be associated with NSSI and SAs was based on previous research indicating that a lower level of mindfulness is associated with higher BPD features (e.g., Wupperman et al., 2008; 2009) and that mindfulness mediates the relationship between BPD features and the likelihood of reporting that one would use NSSI to cope with an imagined stressful situation (Wupperman et al., 2013). The contrast of the lack of findings between SII and baseline mindfulness in the current study and the significant relationship between mindfulness and BPD features in the studies by Wupperman and colleagues (2008; 2009; 2013), suggests that there might be distinct mechanisms accounting for the presence of "BPD features," a BPD diagnosis, and SII. Importantly, exhibiting "BPD features" is not synonymous with having a BPD

diagnosis. As well, there are 9 potential criteria for BPD and only 5 are needed for a diagnosis, leaving multiple permutations of behavioural difficulties that can constitute a diagnosis of BPD. There is even greater variability in the construct of "BPD features," which does not require that the diagnostic criteria are met, or an endorsement of self-harm. As well, in the studies by Wupperman and colleagues (2008; 2009; 2013), the authors used the Personality Assessment Inventory - Borderline Features Scale (PAI-BOR; Morey, 1991) to measure BPD features, which does not directly measure SII. Indeed, the PAI-BOR takes a broad conceptual approach to measuring the areas of affective instability, identity problems, negative relationships, and self-harm. The most direct assessment of self-harm on the PAI-BOR is the item, "When I'm upset, I typically do something to hurt myself"; other items that potentially assess self-harm behaviour consist of broader behavioural descriptions such as "I am a reckless person." Thus, PAI-BOR items that address recklessness or hurting oneself do not provide a clear measure of NSSI or SAs.

A second distinction between the Wupperman and colleagues' (2008; 2009; 2013) studies and the current study arises in potential differences in the construct of "BPD features" between BPD versus non-BPD samples. In other words, emotion dysregulation or SII among individuals with BPD may be conceptually distinct from these behaviours among non-BPD samples. The samples in Wupperman and colleagues (2008; 2009; 2013) were student and psychiatric samples that were not required to meet a diagnosis of BPD. However, there is research suggesting that "BPD features" - such as SII- within non-BPD samples present differently than samples with a BPD diagnosis. For example, Bracken-Minor and McDevitt-Murphy (2014) compared NSSI among individuals that did

and did not meet screening criteria for BPD. Although they found no difference in number of lifetime incidents of NSSI or methods of NSSI between the groups, members of the BPD group more frequently endorsed a greater number of functions of NSSI while affect regulation was the predominant function for those in the non-BPD group, leaving other functions scarcely endorsed in this group. Furthermore, individuals who met BPD screening criteria were significantly more likely than the non-BPD group to report using NSSI to punish themselves, prevent suicide and prevent dissociation. Similarly, Bracken-Minor and McDevitt-Murphy (2014) noted that past research by Rosenthal, Cuckrowicz, Cheavens, & Lynch (2006) also identified self-punishment as a distinguishing feature of BPD when compared to major depressive disorder and other personality disorders. This research suggests that the behavioural difficulties such as NSSI that occur within BPD may be functionally and/or conceptually distinct from the very same behavioural difficulties when they occur among individuals without BPD. Therefore, the studies by Wupperman and colleagues (2008; 2009; 2013) that examine BPD features in student and non-BPD psychiatric samples may be measuring distinct phenomena from those that occur among individuals with BPD.

Null findings may also be explained by research suggesting that mindfulness skills have inconsistent and counter-theoretical associations with adaptive functioning among inexperienced meditators. Indeed, previous research on the KIMS and an elaborated version of the KIMS, called the Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006), have found different patterns of findings between meditators and non-meditators. Baer et al. (2008) compared outcomes of experienced meditators with three samples of non-meditators (i.e., students, community members and a sample

matched to the meditators on demographic variables) on the Brief Symptom Inventory (BSI). The investigators found that mindfulness was related to *increased* symptoms in the student sample, but had *no relationship* with symptom severity among community nonmeditators. For experienced meditators, symptoms were negatively correlated with mindfulness. Consistently, other lines of research examining associations between mindfulness and maladaptive behaviours such as inattention and impulsivity among non-meditators have demonstrated that individuals who lack experience with mindfulness report a range of effects of mindfulness rather than a consistent experience. For example. Soler and colleagues (2012), who found increases in attention and impulse control among a sample of BPD participants after participation in a DBT mindfulness module, highlight the variability of findings in the mindfulness literature. Specifically, Soler et al. (2012) noted that studies examining the relationship between impulsivity and mindfulness among experienced meditators yield consistent evidence of a negative association between mindfulness and impulsivity. In contrast, the breadth of studies conducted on inexperienced meditators have yielded variable findings between mindfulness and functioning ranging from positive, negative to no relationships between mindfulness and maladaptive behaviours (Soler et al., 2012).

There may be a number of explanations for the inconsistent and unexpected findings found among inexperienced meditators. First, understanding and being trained in mindfulness skills may cause experienced meditators to answer the questions on mindfulness self-report measures with more accuracy and insight into their behaviour than inexperienced meditators (Baer et al., 2006; Baer et al., 2008). For example, an experienced meditator may have a different interpretation of items such as “I pay

attention to sounds, such as clocks ticking, birds chirping, or cars passing" or "I notice changes in my body, such as whether my breathing slows down or speeds up" than a non-experienced meditator. These items reflect specific skills that are coached in DBT mindfulness training and approached in a particular way, and it is conceivable that a nonmeditator could have these experiences with negative implications. For example, a positive response to the aforementioned items could reflect symptoms of hypervigilance in an individual with PTSD or the acute attention that individuals with panic attacks often pay to physiological changes (APA, 2013). Hence, it is possible to observe one's experience in a way that is not mindful and this distinction may not be captured in the KIMS.

Thus, extant research suggests that the lack of meditation experience or lack of mindfulness could moderate the theoretical benefits of mindfulness skills, which may account for our unexpected findings at baseline. While there is no precise information about prior meditation or mindfulness experience of the sample in the current study or the studies by Wupperman and colleagues (2008; 2009; 2013), the lack of association between the four facets of mindfulness and SII at baseline may, perhaps, be related to a lack of meditation or mindfulness experience among our sample at that point in time. Indeed, it may be that our sample was more inexperienced in mindfulness and thus made different interpretations or had different experiences of the skills measured by the KIMS leading to a lack of association between mindfulness and SII.

Limitations and Implications for Practice and Research

The current findings suggest that adopting *acceptance without judgment* has a causal relationship to reductions in NSSI and that facets of mindfulness related to present

centred awareness (i.e. *Observe, Describe* and *Acting with Awareness*) might, in fact, be less instrumental. At present, the full DBT treatment package involves hundreds of skills and is highly labour intensive. The most striking implication of this study is the elucidation of *acceptance without judgment* as a specific mechanism that can account for SII outcomes and, therefore, provides a basis for generating more targeted interventions. Indeed, this research suggests that, of the different facets of mindfulness, strengthening *acceptance without judgment* skills might be the most "efficient" route for targeting NSSI in DBT. Specifically, current DBT mindfulness modules might be streamlined by focusing on *acceptance without judgment* skills and related modules, such as compassion and loving-kindness (Linehan, 2014).

The current study had a number of limitations. First, as previously described, a conservative imputation method was used to compensate for participants who discontinued the study by substituting the participants' score at the 10 week mark as their end of treatment score. Relying on participants' 10 week scores allowed for only a brief period of time for improvements from baseline to emerge and these scores may not reflect the benefit that an individual would receive from the full 20-week treatment. Thus, this method was a conservative approach that potentially decreased the power in this study to find effects at the end of treatment. Second, the study sample included individuals with suicidal BPD and, therefore, these findings may not generalize to non-suicidal individuals with BPD or suicidal individuals that do not have BPD. Third, the final sample was also primarily female thus limiting the generalizability of these results to male samples. Fourth, the use of a waitlist control in our study limited the ability isolate the impact of DBT-ST on changes that arose during treatment. In order to assess

the specific effects of DBT-ST on SII, a control group engaged in an active treatment should be used to control for non-specific effects of treatment such as therapeutic alliance. Relatedly, a fifth limitation is that participants were permitted to continue with external treatments other than DBT, which may have included anything from anti-depressant treatment to non-DBT group or individual therapy. Given that we were unable to control for the effects of external treatments, it may be that our findings also capture the effects of these additional therapies. Sixth, though our data on SII was collected using interview methods with strict operational definitions for different forms of SII, participants were still required to report on incidents over the past 10 weeks and retrospective reporting bias may also be a potential limitation of this study. Seventh, the brief length of this intervention, which is significantly shorter than traditional DBT, may not have been a sufficient amount of time to allow the effects of DBT-ST to emerge. Thus, studies that examine longer treatments periods that are more comparable in length to comprehensive DBT can help to elucidate the full effects of DBT-ST. Longer treatment studies could provide the opportunity to determine if the effects of other facets of mindfulness require more time to begin to "operate" but eventually elicit decreases in SII. Relatedly, larger studies that have sufficient power to examine treatment trajectories can help to determine when and how improvements in mindfulness and SII emerge and plateau, which can provide a basis for identifying an appropriate length of DBT-ST treatment. Eighth, given the known differences between inexperienced and experienced meditators, future studies that comprehensively measure participants' meditation and mindfulness experience prior to and during treatment are needed to control for the effects of experience. Ninth, this study only examined one dimension of SII (i.e., frequency of NSSI and SA), but did not

examine the impact of mindfulness on other dimensions of SII such as *severity* of SII or level of *intent* to die. Indeed, individuals can vary significantly in the way in which they harm themselves from superficial scratching to third degree burning of one's skin (Muehlenkamp, 2015). In addition, the dichotomous distinction between suicidal and non-suicidal behaviour is also controversial as many people report experiencing ambivalent feelings about death when harming themselves (Muehlenkamp, 2015). To fully understand the extent of the relationship between SII and mindfulness, it would be useful to measure how *acceptance without judgment* predicts different levels of intent and severity of SII. Finally, although efforts were made to bolster the external validity of this study by allowing individuals to continue pharmacotherapy and participation in pre-existing non-DBT psychotherapy, the controlled nature of this study protocol may limit its generalizability to the application of DBT in community settings.

There are a number of limitations of the KIMS, the measure used to assess the facets of mindfulness. Researchers do not consistently agree on whether operationalizations of mindfulness should directly include nonjudgment. Brown and Ryan's (2003) Mindful Attention Awareness Scale (MAAS) leaves out attitudinal components such as nonjudgment, arguing that awareness is most fundamental to mindfulness and that attitudinal components of mindfulness are too closely conflated with other constructs related to well-being. The Toronto Mindfulness Scale (Lau et al., 2006) operationalizes mindfulness as decentering from one's experience and curiosity of one's experience. While these two conceptualization differ greatly, in both cases, nonjudgment is theoretically acknowledged as an attitudinal component of mindfulness but is seen as a consequence of the more fundamental skills measured in these scales such

as awareness or curiosity. This raises the issue of whether nonjudgment is a unique process in mindfulness or if it is a higher-order construct and, potentially, a byproduct of other mechanisms. The difficulty distinguishing nonjudgment from other constructs highlights this issue further. Coffey, Hartman and Frederickson (2010) combined the items on the FFMQ (a lengthier version of the KIMS) and a measure of emotion regulation and found that many of the factors from the two original measures loaded together. Specifically, the acceptance without judgment scale heavily overlapped with an acceptance subscale on the emotion regulation measure to create a compound factor, suggesting redundancy between the operationalization of mindfulness and emotion regulation. Furthermore, many of the items on the KIMS *acceptance without judgment scale* items imply that negative judgments are particularly "unmindful." A number of items closely relate to the construct of self-criticism thus diverging from the essence of nonjudgment, which does not assess experience as *bad or good* (e.g. "I criticize myself for having irrational or inappropriate emotions"). Consequently, the KIMS acceptance without judgment scale may measure multiple skills simultaneously that are not unique to mindfulness and are secondary byproducts of mindfulness mechanisms. The methods used for assessing mindfulness contribute to confusion on these issues. Currently, the most concrete measure of mindfulness available assesses awareness (such as neurobiological measures of attention) while the nonjudgment components of mindfulness are limited to retrospective self-report, making it difficult to precisely measure nonjudgment and differentiate it from other constructs. In order to delineate the role and unique characteristics of nonjudgment. more rigorous methods that can elucidate the process of nonjudgment during the application of mindfulness are needed.

These findings also open up many other opportunities for future research. There are a number of unanswered questions about the impact of *acceptance without judgment* on NSSI and how to go about strengthening this skill. In service of streamlining DBT, one future objective could be to determine whether offering *acceptance without judgment* skills in the absence of the other mindfulness modules would yield reductions in NSSI. To this end, it would be useful to compare one group exposed to training in all the facets of mindfulness *except acceptance without judgment* skills training modules to another group exposed to non-judgment alone. This would determine whether the *acceptance without judgment* skill would be a sufficient mechanism accounting for reductions in SII.

SII is one of many features associated with BPD but many of the other symptoms of BPD are rooted in shame and experiential avoidance (Kuo & Linehan, 2009; Iverson et al., 2011; Crowe, 2004). Thus, the effect of nonjudgment compared to other facets of mindfulness should also be explored in relation to other features associated with BPD such as anger and overall emotion regulation ability, in order to strengthen the basis for streamlining DBT to emphasize *acceptance without judgment* skills.

While much remains to be examined, the current study suggests that individuals with BPD can reduce habitual judgments of their experience and, consequently, their engagement in NSSI. The findings provide encouraging support that a streamlined treatment that focuses on acceptance without judgment could benefit individuals with BPD.

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