ASSESSING THE RELATIONSHIP BETWEEN MINDFULNESS, BORDERLINE FEATURES, AND EMOTIONAL AWARENESS IN YOUNG ADULTS

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By

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CHAPTER I

Mindfulness, Awareness, and Borderline Features

Borderline personality disorder (BPD) is often considered a devastating disorder both for the individual and mental health services (Levy, 2005). At the core of this disorder is a great deal of emotional instability (Diagnostic and Statistical Manual of Mental Disorders, Text Revision, 4th ed. [DSM-IV-TR]; American Psychiatric Association [APA], 2000), often described as emotional lability (Koenigsberg et al., 2002). A recent psychological treatment for borderline patients (dialectical behavior therapy, DBT; Linehan 1993a, 1993b) has included mindfulness teachings with the intent to improve emotion regulation ability (Linehan, Bohus, & Lynch, 2007). Research findings appear to support DBT and its mindfulness component as a way to help increase emotion regulation abilities in that population (i.e., Bohus et al., 2004; Koons et al., 2001). However, at this time, the effect of DBT on emotional lability and the specific role of being mindful in improving emotion lability are still not well understood. Because of the severity of BPD and the infancy of the research, understanding borderline symptoms during the earliest stages of development of the disorder can bring insight into processes that could potentially worsen or improve emotion regulation (i.e., emotional awareness).
This chapter reviews the literature related to borderline features, mindfulness, and emotional awareness. The literature suggests that young adults with borderline features are less likely to be mindful and aware of their emotional experiences.

Overview of BPD

Epidemiology

BPD is a severe disorder (Levy, 2005). A central concern with that population is its high rate of self-injury. Sixty-nine % to 75 % of individuals diagnosed with BPD try to hurt themselves during their life time (Kjellander, Bongar, & King, 1998; Levy, 2005). Even more concerning is the disorder’s high suicide rate (Levy, 2005). For borderline patients, this suicide rate can range from 3 % to 9.5% (McGlashan, 1986). These self-injurious behaviors also lead to an extensive use of mental health facilities (Levy, 2005). Borderline patients are, in fact, prominent in inpatient facilities. Twenty percent of the inpatient population has a diagnosis of BPD (DSM-IV-TR, APA, 2000; Johnson, Hurley, Benkelfat, Herpetz, & Taber, 2003; Levy, 2005). Self-harming tendencies may be related to a difficulty in regulating emotional experiences (Linehan, 1993a; Lynch, Chapman, Rosenthal, Kuo, & Linehan, 2006). Consequently, understanding the difficulties these patients experience, including their emotional difficulties, appears of utmost necessity.
Description of BPD

BPD is a disorder mainly characterized by “a pervasive pattern of instability of interpersonal relationships, self-image, and affects, and marked impulsivity beginning by early adulthood and present in a variety of contexts” (DSM-IV-TR, APA, 2000, p.710). Emotional instability is at the core of this disorder (Corrigan, Davidson, & Heard, 2000; DSM-IV-TR, APA, 2000; Herpertz, Kunert, Schwenger, & Sass, 1999; Johnson et al., 2003; Linehan, 1993a; Putnam & Silk, 2005; Siever & Davis, 1991; Siever, Torgersen, Gunderson, Livesley, & Kendler, 2002; Silk, 2000; Stiglmayr, Shapiro, Stieglitz, Limberger, & Bohus, 2001; Zanarini, Frankenburg, Hennen, & Silk, 2003).

The emotional instability experienced by borderline patients is also often defined as emotional lability (i.e., Koenigsberg et al., 2002). This emotional lability is described as an emotional pattern that represents changes or shifts between emotional experiences (Harvey, Greenberg, & Serper, 1989). Various labilities have been observed in borderline patients. Koenigsberg et al. (2002) described lability in terms of anger and anxiety with euthymia as well as vacillation between depression and anxiety. Ebner-Priemer, Kuo et al. (2007) observed a rapid decline in positive mood that, at times, can reach a negative emotional state. As a whole, a review by Nica and Links (2009) indicated that individuals with a borderline diagnosis and borderline tendencies experience intense negative moods, and more variability in negative affect compared to healthy control or patients with other disorders including major depression. However, the findings are not consistent, as Russell, Moskowitz, Zuroff, Sookman and Paris (2007)
found that individuals with a diagnosis of BPD did show some mood variability but not for unpleasant affect even though these individual reported high mean of negative affect compared to healthy control participants.

Clearly, emotional lability is a pattern that is commonly found in the emotional experience of borderline patients (Goodman et al., 2003), but specific patterns of mood variability are still inconsistent.

Borderline patients commonly report certain emotions, such as anger, anxiety, and depression (DSM-IV-TR, APA, 2000; Ebner-Priemer, Welch et al., 2007; Koenigsberg et al., 2002; Jang, Dick, Wolf, livesley, & Paris, 2005). However, the specific report of positive emotions in borderline patients is rarely noted in research findings. Ebner-Priemer, Welch et al. (2007) did find that borderline patients had a tendency to report less happiness and interest.

Emotional instability is an important factor to consider when researching borderline tendencies. In fact, most symptoms defining the disorder are related to this emotional instability. Four of the nine criteria defining BPD are clearly associated to this emotional instability: (a) Borderline patients show a “marked reactivity of mood (intense episodic dysphoria, irritability, or anxiety usually lasting a few hours and only rarely more than a few days); (b) chronic feelings of emptiness; (c) inappropriate, intense anger or difficulty controlling anger (e.g., frequent display of temper, constant anger, recurrent physical fights) and (d) transient, stress-related paranoid ideation or severe dissociative symptoms” (DSM-IV-TR, APA, 2000, p. 710). The other five criteria can be
related indirectly to emotional instability: (a) “frantic efforts to avoid real or imagined abandonment; (b) unstable and intense interpersonal relationships characterized by alternating between extremes of idealization and devaluation; (c) identity disturbance: markedly and persistently unstable self-image or sense of self; (d) impulsivity in at least two areas that are potentially self-damaging; (e) recurrent suicidal behavior, gestures, or threats, or self-mutilating behavior (DSM-IV-TR, APA, 2000, p. 710).

**BPD and Awareness**

Despite borderline patients’ reports of intense emotional experiences, they are thought to demonstrate deficits in emotional awareness compared to individuals without the disorder (Farrell & Shaw, 1994; Levine Marziali, & Hood, 1997; Linehan, 1993a). Emotional awareness is “the extent to which people are aware of emotions in both themselves and others” (Ciarrochi, Caputi, & Mayer, 2003, p. 1478). These patients appear to have difficulty processing information regarding their emotional experiences (Levine et al., 1997). Borderline patients compared to non-borderline patients also have difficulty differentiating between their own emotional experiences (Ebner-Priemer, Welch et al., 2007; Levine et al., 1997; Linehan, 1993a) as well as the emotional experiences of others (Levine et al., 1997). They, for example, have a tendency to report more non-specific emotions than healthy controls (Ebner-Priemer, Welch et al., 2007). Similarly, Wolff, Stiglmayr, Bretz, Lammers, and Auckenthaler, (2007) have also found that individuals with a diagnosis of BPD have more difficulty identifying their emotions and are more likely to report aversive tension instead of a
specific emotion. Ambiguous responding from others was more difficult to decipher and coordinate for these patients as well (Levine et al., 1997). Moreover, borderline patients also report more alexithymia, or a difficulty in understanding or communicating emotional turmoil (Modestin, Furrer, & Malti, 2004). Emotional awareness difficulties are present in BPD and may even be central to the development of the disorder (Farrell & Shaw, 1994).

Theorists have speculated that the emotional awareness difficulties present in borderline patients may stem from an early environment in which children are taught to deny their emotional experiences (Cheavens et al., 2004; Gratz, 2006; Linehan, 1993a, 1993b; Wupperman, 2007; Zanarini et al., 1997). Consequently, from early on, a child learns to dismiss his or her emotional experiences. If this child does not learn to attend to his or her experiences at some point, he or she is less likely to be aware and have a full understanding of these experiences (Wupperman, 2007).

Furthermore, if a child is taught to mistrust and inhibit expressions of inner experiences, he or she is likely to develop strategies to conceal these emotions instead of learning to express them effectively. In fact, in adulthood, borderline patients have tendencies that also further limit emotional awareness. For example, borderline patients use avoidance or escape strategies in response of emotional stressors (e.g., Bijttebier & Vertommen, 1999; Kruedelbach, McCormick, Schulz, & Grueneich, 1993). One such strategy is thought suppression (Rosenthal, Cheavens, Lejuez, & Lynch, 2005). Some researchers even proposed that self-harming behaviors are a form of emotional
avoidance (Gratz, 2006; Gratz & Gunderson, 2006). Newhill, Mulvey, and Pilkonis (2004)
and Russ, Roth, Kakuma, Harrison, and Hull (1994) believe that self-harming behaviors
could act as a form of analgesia. Again these self-harming behaviors are common in
borderline patients (Gratz & Gunderson, 2006; Gunderson, 2001; Newhill et al., 2004).
Even as adults, by not attending to one’s emotional experiences, a person is less likely to
be aware of these experiences, implying that borderline patients may also maintain
their emotional awareness deficit(s).

These various avoidant coping strategies are inherently ineffective as they
paradoxically increase the experience of negative affect (Follette, Palm, & Rasmussen
Hall, 2004; Salkovskis & Campbell, 1994; Wegner, Erber, & Zanakos, 1993) and can
consequently create emotion regulation difficulties. Avoidance of emotions and
thoughts related to these emotions may help maintain the beliefs that emotions and
thoughts are harmful (Prairie, 2004) and having these thoughts and emotions may bring
a lack of mastery and self-efficacy (Cheavens et al., 2005; Wupperman, 2007).
Increasing emotional awareness is therefore likely to benefit borderline patients and
may help improve emotion regulation, even simply by limiting avoidance tendencies.

Young Adults with Borderline Features

Because of the severity of this disorder, understanding borderline symptoms at
onset or at sub-syndromal levels could potentially help reduce some of the negative
outcomes of this condition. In fact, BPD appears to be a disorder that affects mainly
younger adults. Many borderline patients are diagnosed with this disorder in early adulthood and most borderline symptoms decrease after 30-40 years old (DSM-IV, APA, 2000; Trull, 1995). Early adulthood is also important as this is the time when the greatest risk of suicide occurs (DSM-IV, APA, 2000). Consequently, understanding borderline tendencies during early adulthood could help increase insight into the development of BPD.

Borderline features appear on a continuum ranging from nonclinical to clinical (Widiger, 1992). Individuals with borderline features are individuals who only have some of the characteristics of BPD (Zeigler-Hill & Abraham, 2006). In other words, these symptoms are present at various degrees in nonclinical populations with some individuals that may not necessarily meet criteria for BPD (Trull, 1995; Zeigler-Hill & Abraham, 2006). In addition, some borderline symptoms are present in the nonclinical population because some borderline patients may not be diagnosed with the disorder as they may not seek psychological treatment (Gunderson & Zanarini, 1987). Consequently, studying participants with borderline features is possible if these features appear in the general population as well as in the clinical population (Widiger, 1992).

Even if individuals do not meet full criteria for BPD, understanding people with borderline features can have its advantages. People with borderline features have shown difficulties similar to difficulties found in BPD (Trull, 1995). Some of the difficulties that individuals with borderline features endorse are affect and mood disturbances (Trull, 1995; Zeigler-Hill & Abraham, 2006) and interpersonal distress (Trull,
These two deficits are two of the criteria defining BPD (DSM-IV-TR, APA, 2000). Borderline features also predict the continuity of borderline symptoms over time (i.e., Bagge et al., 2004; Tragesser, Solhan, Schwartz-Mette, & Trull, 2007). For example, Bagge et al. (2004) demonstrated that borderline features can predict poor social adjustment two years after initial assessment. In Bagge et al.’s (2004) study, the borderline features of affective instability and impulsivity were the two best predictors of later negative outcomes. In sum, young adults with borderline features also experience emotional instability and this instability can predict later negative outcomes.

**Measuring Emotional Lability**

Various methods have been used to assess emotional lability. Reporting emotions “in the present moment” refers to the emotions the person is currently feeling. “General emotions” reports define the emotions a person would feel in general (Robinson & Clore, 2002b). “Retrospective” emotion reports comprise information about the person’s past emotional experiences (Robinson & Clore, 2002b). A few researchers have assumed that retrospective methods may introduce a recall bias compared to methods assessing emotional lability in the present moment (i.e., Ebner-Priemer, Kuo et al., 2007; Tennen & Affleck, 2002; Tolpin, Gunthert, Cohen, & O’Neill, 2004; Zeigler-Hill & Abraham, 2006). Experience sampling methods assessing current emotional experiences are believed to limit this bias as recall occurs at the same time as the experience (Zeigler-Hill & Abraham, 2006; Tennen & Affleck, 2002).
More importantly, retrospective methods may not simply introduce a recall bias but instead may measure a different form of emotional experience than methods of assessment which inquire about current emotional experiences (Robinson & Clore, 2002a, 2002b; Conner-Christensen, 2003). According to Robinson and Clore (2002a, 2002b) when participants report how they feel in general, they are likely to access their semantic memory. Semantic emotional knowledge refers to the “beliefs that one has concerning one’s emotions” (Robinson & Clore, 2002b, p. 199). When a person reports his or her current emotional experiences, he or she is likely to use experiential information (Robinson & Clore, 2002a). These participants are therefore likely to report episodic emotion knowledge or “one’s emotions in a particular place at a particular time (Robinson & Clore, 2002b, p. 199). Each time frame seems to represent different information regarding one’s emotional experience. For instance, when a person reports that in general she or he is a happy person, he or she accesses semantic knowledge. However, when the same person states that in the present moment he or she feels angry, he or she uses experiential information and accesses episodic knowledge.

To actually observe the emotional lability found in individuals who report some degree of borderline features, assessing subjective emotional experiences in the present moment appears to be the most appropriate method of gathering information. In fact, episodic memory often declines rapidly (Robinson & Clore, 2002a). In other words, when asked to recall emotional information, some emotional aspects of the event are likely to fade away rapidly. The longer the assessment is from the actual experience the
more a person increasingly relies on generalized beliefs to report emotional experience (Robinson & Clore, 2002a). Consequently, retrospective assessments are less likely to represent actual emotional experiences but rather what one believes he or she is generally experiencing (Robinson & Clore, 2002a). Furthermore, emotional lability is a dynamic process and should be observed over time (Larsen, 2000). Changes in emotional experiences would then be best assessed by having individuals repeatedly report on their present emotions over a defined period of time. It seems that online reporting of current emotional experience should provide the best indicator of emotional lability, as it is the most likely to investigate experiential knowledge and include the emotional experience as is and not the general belief of what the person thinks he or she usually experiences. It can also help monitor experience over time.

There are two studies that have measured emotion lability in the present moment through experience sampling methods with young adults with borderline features (Tolpin et al., 2004; Zeigler-Hill & Abraham, 2006). These two studies found the presence of emotional lability in individuals with borderline features. Zeigler-Hill and Abraham (2006) had participants record how they felt in the present moment on an adapted version of the paper and pencil measure of the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) daily for seven consecutive days. Their study showed that participants with borderline features experienced a systematic low and unstable positive affect. Furthermore, individuals with borderline features also experienced unstable negative affect so that the more a person endorsed borderline
features, the higher level of unstable negative affect they reported (Zeigler-Hill & Abraham, 2006).

Tolpin et al. (2004) also used an experience-sampling method assessing current emotional experiences with the adapted version of PANAS, the Positive and Negative Affect Schedule-Expanded Form (PANAS-X; Watson & Clark, 1994), for 2 weeks at the end of each day. In Tolpin et al.’s (2004) study, young adults with borderline features showed a trend toward less carry-over of negative emotional experience from day to day. By “carry-over,” Tolpin et al. (2004) refer to how emotions reported on one day influence the reports of emotions on the following day. Furthermore, they also found higher within-subject standard deviation for daily negative emotions showing variability of negative emotional experiences for individuals with borderline features. However, in their study no greater variability was found for positive emotional experiences.

These two studies with young adults with borderline features used a similar experience-sampling procedure to assess emotional lability in the present moment and over time. Even though the emotional lability was present in young adults with borderline features, these two studies did not uncover the same emotional pattern in that population. Zeigler-Hill and Abraham (2006) showed the presence of unstable positive affect while Tolpin et al. (2004) did not. These two studies did reveal the presence of unstable negative affect. It is possible that the method of assessment used may not be optimum to reveal the emotional pattern present in that population. In particular, the two studies gathered current emotional information only once a day. It is
commonly believed, however, that the emotional pattern of borderline patients changes more rapidly than once a day. As the DSM-IV-TR (APA, 2000) indicates, borderline patients rapidly shift between emotional experiences within a few hours. Consequently, to assess the emotional lability present in young adults with borderline features, more frequent assessments may be necessary. Online experience-sampling using short intervals (i.e., every hour or a few hours) between emotional assessments should be effective in capturing the emotional lability in young adults with borderline features. Furthermore, to reflect a comprehensive measure of affect, emotions with varying levels of activation should be included (Feldman Barrett & Russell, 1998) as it may represent a more accurate picture of the emotional lability present in young adults who endorse more borderline features. In fact, as previously mentioned, borderline patients often report experiencing depression (DSM-IV-TR, APA, 2000; Ebner-Priemer, Welch et al., 2007; Koenigsberg et al., 2002; Jang et al., 2005) and depression or sadness may be important to assess for that population and young adults with borderline features as well.

**Borderline Features and Awareness**

Similar to the experience of emotional lability, young adults with borderline features are also a group that shows emotion awareness difficulties. In fact, college students with higher borderline symptoms reported less emotional clarity as well as a tendency to pay less attention and be less aware of their inner emotional experiences (Leible & Snell, 2004). These researchers used self-report measures, the Trait Meta-
Mood Scale (Salovey, Mayer, Goldman, Turvey, & Palfai, 1995) and the Multidimensional Emotional Awareness Questionnaire (Snell, 1999) to measure aspects of emotional intelligence and awareness. Individuals with borderline features are also likely to engage in behaviors that may maintain a low level of awareness. For example, young adults with borderline features have tendencies to adopt avoidance techniques, such as avoiding their thoughts in relation to aversive emotions (Cheavens et al., 2005). Self-report measures of awareness may not assess all aspects of emotional awareness. More implicit measures of emotion awareness may provide an important source of information and understanding regarding an individual’s degree of emotional awareness. Furthermore, individuals who endorse borderline features still report emotions, but they may not necessarily be fully aware of how accurate they are regarding how they feel or may have difficulty to describe their emotional experiences. It is therefore important to assess emotional awareness with multiple methods, including implicit methods, in order to have greater understanding of the possible deficits in that population.

Awareness

As previously mentioned, the emotion lability and the lack of emotional awareness present in young adults with borderline features (Cheavens et al, 2005; Leible & Snell, 2004; Tolpin et al., 2004; Zeigler-Hill & Abraham, 2006) seem to indicate that young adults with some borderline features may have difficulty regulating their
emotions. Furthermore, one of the most predictive borderline features of later negative outcomes is emotional instability (Bagge et al., 2004; Tragesser et al., 2007).

**Emotions**

But what are emotions? Emotions are biological reactions that enable the coordination of response systems to help individuals respond adaptively to their stressors (e.g., Izard, 1979; Levenson, 1994). Emotions can have “experiential, behavioral, and central and peripheral physiological” components (Gross, Richards, & John, 2006, p.14). They are also tied to cortical functioning as are cognitive processes (Ledoux, 1994). The extent that cognitive processes are involved with the experience of an emotion can vary (Ledoux, 1994). Emotions can be automatic and have little relation with cognitions, or they can involve a great amount of cognitive control over the experience of an emotion (Ledoux, 1994). This cognitive control can play a role in the way one appraises and, consequently, copes with or regulates emotional experiences associated with an event (Lazarus, 1991, 1994).

**Definition of Emotion Regulation**

Gross (1999) defined emotion regulation as various processes which help regulate emotions. More specifically, it is “the processes by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions” (Gross, 1998, p. 275). This definition of emotion regulation indicates that individuals have the ability to affect their own emotional experiences. The extent
and the manner in which a person influences his or her experiences can lead to effective or ineffective emotion regulation.

A few components of effective emotion regulation have been described throughout the literature. One example is the ability to simply tolerate negative emotional experiences (i.e., Van Der Kolk, 2006). This technique seems to be closely related to the recently developed emotional exposure, interoceptive exposure, which is thought to provide effective emotion regulation by attending to, noticing and accepting inner experiences, including aversive sensations (Otto, Powers, & Fischmann, 2005; Otto, Safren, & Pollack, 2004; Tull, Schulzinger, Schmidt, Zvolensky, & Lejuez, 2007).

Conceptually, the ability to attend to and notice inner experiences should increase emotional awareness (Paivio & Laurent, 2001), characteristics considered central to effective emotion regulation abilities (Gratz & Roemer, 2004; Linehan, 1993a). Being aware may help individuals to make a subtle distinction between specific emotional states, another important factor of effective emotion regulation (Larson, 2000). Being able to notice subtle differences between emotion experiences is related to the perspective that discrete emotions are more adaptive than global emotions, a perspective defined as Affect-as-Information (Feldman Barrett, Gross, Conner Christensen, & Benvenuto, 2001). This perspective indicates that discrete emotions leave less room for misattribution errors (Clore & Parrot, 1991; Feldman Barrett et al., 2001; Keltner, Locke, & Audrain, 1993; Schwarz, 1990, Schwarz & Clore, 1996). It is based on the idea that discrete emotions are more likely to be associated to a causal
object or source unlike global affects (Feldman Barrett et al., 2001; Russell & Feldman Barrett, 1999).

Mindfulness and Awareness

As noted earlier, mindfulness training has recently been incorporated into therapies for BPD (e.g., Linehan, 1993a; 1993b), yet the mechanisms by which it might benefit such individuals are not yet well-understood. Mindfulness is a philosophy with eastern origins (Bishop et al., 2004; Brown & Ryan, 2003; Germer, Siegel, & Fulton, 2005). The practice of mindfulness also emphasizes attending to, noticing and accepting one’s emotional experiences, which is also believed to increase emotional awareness (Bishop et al., 2004). Conceptually then, being mindful is related to being aware (i.e., Bishop et al., 2004). Current research findings support the relationship between mindfulness and awareness. Brown and Ryan (2003) have associated the state of being mindful to greater awareness of inner experiences. Baer, Smith and Allen (2004) found a positive relationship between mindfulness and emotional intelligence, and a negative relationship with alexithymia or having difficulty describing one’s feelings and experiential avoidance. In their study, Baer, et al. (2004) measured emotion intelligence with the Trait Meta-Mood Scale (TMMS; Salovey et al., 1995). They measured alexithymia with the Toronto Alexithymia Scale (TAS-20; Bagby, Parker, & Taylor, 1994). These scales are self-report measures that assess subjective report of awareness. Using implicit measures of awareness may provide another more objective way to assess facets of emotional awareness. Being mindful, therefore, seems to reflect greater
awareness of inner experiences, including emotional experiences. Borderline patients and young adults with borderline features appear to lack this tendency to be mindful. Baer et al. (2004) found borderline patients to be less mindful compared to participants without the diagnosis. Furthermore, Wupperman (2007) associated young adults with borderline features to being less mindful as well.

Being mindful and being aware is also related to effective emotion regulation (Brown & Ryan, 2003). Being mindful may be a factor that can actually improve emotion regulation abilities. Mindfulness principles have been included in psychological treatment (i.e., DBT, Linehan, 1993a; 1993b) for this specific reason (Linehan et al., 2007). One of mindfulness’ teachings in DBT includes staying in the present moment in a non-judgmental manner and with acceptance (Linehan, 1993a, 1993b). More specifically, a person is to maintain one’s attention on internal or external events occurring in the present moment without evaluating or judging that event. A person is to notice arising thoughts, emotions, or reactions and accept them as they are and without defense (Baer, 2003). Linehan (1993a, 1993b) included exercises that attempt to increase emotional awareness directly, such as learning to label and differentiate between specific emotional experiences.

Mindfulness principles may help improve emotion regulation by increasing emotional awareness. By being aware and noticing internal experiences as they are, a person may view these experiences simply as thoughts or emotions (Baer, 2003) and be less likely to over-identify or react to these internal events (Bishop et al., 2004). For
instance, an individual may recognize the experience of an emotion (e.g., anger), notice
the thoughts related to that emotion and then decide whether to act on that
emotion/thought or not (Eifert, McKay, & Forsyth, 2006). Furthermore, learning to pay
attention to inner experiences and accepting them without judgment could increase
tolerance of these experiences and limit avoidance tendencies (Baer, 2003). If a person
limits avoidance tendencies, he or she is also less likely to increase negative emotional
experiences, a likely consequence of emotional avoidance (Follette et al., 2004;
Salkovskis & Campbell, 1994; Wegner et al., 1993). By paying attention to one’s
emotional experience, the individual is also increasingly likely to notice subtle
differences between these experiences and increase his or her understanding of his or
her emotional experiences which may also increase effective emotion regulation.

Other treatments beside DBT have also emphasized increasing emotional
awareness in borderline patients. Bateman and Fonagy’s (1999, 2001)
psychoanalytically oriented partial hospitalization intervention describes a form of
emotional awareness training, mentalization. These authors defined mentalization as
“the capacity to think about oneself in relation to others and to understand others’ state
of mind” (Bateman & Fonagy, 1999, p. 1565). By focusing on mental states (i.e.,
thoughts and feelings) a person with borderline features may be able to clarify his or her
emotional experiences (Fonagy & Bateman, 2006). Gratz and Gunderson (2006) have
recently developed a time-limited group intervention that also emphasizes emotional
awareness, such as learning to differentiate between emotional states.
These interventions have found positive outcomes with borderline patients. Borderline patients engaged in self-harming behaviors less frequently following DBT training (i.e., Bohus et al., 2004; Linehan, Armstrong, Suarez, Allmon, & Heard, 1991; Linehan et al., 2006), following partial hospitalization (Bateman & Fonagy, 1999; 2001), and following Gratz and Gunderson’s (2006) training. They also reported less emotional distress as measured by less depression, anger and anxiety after DBT training (e.g., Bohus et al., 2004; Koons et al., 2001). A decrease in anxiety and depression was also observed following partial hospitalization (Bateman & Fonagy, 1999; 2001). At this time however, no study has examined the effect of being mindful and, more specifically, being aware on emotional lability (i.e., dependent variable).

It appears that being mindful or at least learning to pay attention to and understand one’s emotional experiences -- including discriminating among emotional experiences (i.e., learning to be emotionally aware) -- could benefit borderline patients. It also seems that borderline patients and young adults with borderline features could also learn to be more emotionally aware. In fact, following DBT training, borderline patients reported fewer non-specific emotions (Ebner-Priemer, Welch et al., 2007). Consequently, learning to be mindful may increase emotional awareness even in borderline patients or young adults with borderline features and possibly increase effective emotion regulation skills. However, what it not known at this time is the precise nature of the emotional awareness deficits that young adults with borderline features show, or the types of emotional awareness that young adults who have a
tendency to be mindful show. Understanding a) the specific deficit in emotional awareness that individuals who report borderline tendency experience and b) what specific awareness mindfulness may enhance, could help focus possible treatment approach to individuals who report borderline tendencies.

*Conner-Christensen’s Types of Awareness*

Recent research in the emotion literature has highlighted the various forms of emotional awareness that individuals may have. Conner-Christensen (2003) proposed multiple types of awareness. She defined types of awareness that are related to specific forms of memories (i.e., semantic, episodic). For instance, the use of semantic memory would relate to *noetic* awareness, meaning “knowing” in Greek (Conner-Christensen, 2003). This noetic awareness refers to awareness of general information such as how one generally feels, independently of context. On the other hand, *autonoetic* awareness, Greek for “self-knowing,” is context-dependent (Conner-Christensen, 2003). This autonoetic awareness is retrieved by episodic memory (Conner-Christensen, 2003). Autonoetic awareness refers to items such as how one felt at a given time and place (i.e., an hour ago, or today). This autonoetic awareness can also be applied to the present (Conner-Christensen, 2003), that is, how one feels right now.

Conner-Christensen (2003) calls this type of awareness *autonoetic awareness for autobiographical present*. This type of awareness would more likely use working memory for retrieval (Conner-Christensen, 2003). Experience-sampling studies that
assess current emotional experiences are most likely to assess one’s autonoetic awareness for autobiographical present (Conner-Christensen, 2003).

From Bishop et al.’s (2004) definition of mindfulness, people who practice mindfulness do so by bringing their attention to the present moment. Consequently, people who are mindful should also have a tendency to maintain their attention in the present moment and notice and be aware of their current emotional experiences. It is therefore, likely that the more a person is mindful, the more he or she would have autonoetic awareness for autobiographical present.

Assessing Forms of Emotional Awareness

Again, online experience sampling procedures assessing current emotional experiences should probe this autonoetic awareness of autobiographical present (Conner-Christensen, 2003). But not all individuals are thought to have full access to how they feel in the present moment (Conner-Christensen, 2003). If an individual is unable to know what he or she is feeling in the present moment, Conner-Christensen (2003) believes that this person tends to retrieve knowledge other than experiential knowledge to answer how he or she feels currently. For instance, if a person is unable to define his or her current emotion, he or she may simply report how he or she feels in general (i.e., semantic emotional knowledge) (e.g., angry) to describe his or her current emotional experience. Using semantic emotional knowledge indicates that the probing of emotions would reflect noetic (i.e., general knowledge) instead of autonoetic
awareness (knowledge about current emotional experiences) (Conner-Christensen, 2003).

One method to assess if a person is more likely to show noetic awareness instead of autonoetic awareness when answering how he or she currently feels is to determine how closely related the content of his or her present emotions is to how he or she reports feeling in general (Conner-Christensen, 2003). If the two contents are closely related then the individual is more likely to assess semantic knowledge and probe noetic awareness (Conner-Christensen, 2003). If the individual’s current feelings are distinct from how he or she reports feeling in general, then the participant is more likely to access experiential knowledge and reveal autonoetic awareness (Conner-Christensen, 2003).

**Emotion Differentiation**

A second method of assessing emotional awareness involves assessing the ability to differentiate among current emotional experiences. Learning to differentiate between emotional experiences for both negative (Feldman-Barrett et al., 2001) and positive emotions (Feldman-Barrett et al., 2001; Tugade, Fredrickson, & Feldman Barrett, 2004) appears to be an important factor in effective emotion regulation (Feldman-Barrett et al., 2001; Larsen, 2000; Paivio and Laurent, 2001; Tugade et al., 2004) and a deficit in borderline patients (Ebner-Priemer, Welch et al., 2007; Levine et al., 1997) and possibly young adults with borderline features. Greater differentiation (Feldman Barrett et al., 2001) – or as Tugade et al. (2004) named it *emotional granularity* – between
emotional experiences is thought to show effective emotion regulation because the more a person can distinguish between emotional experiences, the more he or she can notice the specific information related to that specific emotion, such as its origin (Feldman Barrett et al., 2001; Tugade et al., 2004). Borderline patients may, in fact, need to learn to differentiate between emotional experiences, as they have a tendency to report higher frequency and more negative emotions compared to healthy controls (Ebner-Priemer, Welch et al., 2007). Furthermore, before DBT treatment, these patients had a tendency to report non-specific emotions (Ebner-Priemer, Welch et al., 2007). Consequently, learning to differentiate between emotional experiences seems possible and may be important in learning to regulate one’s emotional experiences for that population.

Testing the ability to differentiate between emotional experiences has been achieved by taking the correlation among people’s ratings of similarly-valenced emotions in experience sampling assessments (i.e., Feldman Barrett et al., 2001; Tugade et al., 2004). For example, someone whose reports of anger and depression always covary with each other would be considered to have low differentiation between these two affects, whereas someone whose reports of anger and depression are relatively independent of each other would have a high degree of differentiation between these two affects. Thus, higher correlations between similarly-valenced emotional experiences represent less differentiation between emotional experiences (Feldman Barrett et al., 2001; Tugade et al., 2004). Lower correlations between similarly-valenced
emotional experiences represent greater differentiation between emotional
experiences (Feldman Barrett et al., 2001; Tugade et al., 2004).

Despite the methods that are available for assessing forms of emotional
awareness, they have not been used to understand the nature of emotional awareness
among young adults who have a tendency to be mindful or young adults who report
some degrees of borderline features. The present study is the first to assess the
presence of this autonoetic awareness of the present moment in relation to one’s
extent of mindfulness as well as the lack of autonoetic awareness of the present
moment in relation to one’s extent of borderline features.

The Present Study

This experience sampling study aimed to understand the relationship between a
person’s tendency to be mindful and his or her degree of emotional lability and
emotional awareness in a sample of young adults. More specifically, this study assessed
the role of emotional awareness in the relationship between one’s degree of borderline
features, one’s degree of emotional lability, and one level of mindfulness.

Emotional Lability

As previously reviewed, the more a person reports borderline features the more
likely a person is to show emotional lability using within-subject standard deviation
indexes (i.e., Zeigler-Hill & Abraham, 2006). The within-subject standard deviation index
of emotional lability measures how extremely a person’s emotional experiences tend to
vary around their own average level. Additionally, these individuals are less likely to endorse mindfulness tendencies (Wupperman, 2007). Consequently, for preliminary analysis,

1. Higher scores on the borderline features scale should be positively associated with emotional lability of both positive and negative emotions

2. Higher scores on the borderline features scale should be negatively associated with the tendency to be mindful

It is possible that the association between the tendency to be mindful and emotional lability may differ depending on the extent to which one reports borderline features. DBT, and more specifically the component of mindfulness in DBT (Wupperman, 2007), is thought to be effective in decreasing borderline symptoms (i.e., Bohus et al., 2004; Linehan et al., 1991; Linehan et al., 2006). Furthermore, being mindful is also associated with effective emotion regulation in the general population (Brown & Ryan, 2003). If a person has a tendency to be mindful, he or she might have more effective coping tendencies. The more a person endorses borderline features, the more this person is likely to show ineffective emotion regulation ability. However, if a person with borderline features has a tendency to be mindful, he or she may show a lesser degree of emotion lability compared to someone without borderline features. Consequently,

3. The higher the score on the borderline features subscale, the more the tendency to be mindful should predict lower levels of emotional lability.
Emotional Awareness

The more a person endorses borderline features, the more he or she shows deficits in emotional awareness such as a low tendency to pay attention to and be aware of their emotional experiences (i.e., Leible & Snell, 2004). They also have tendencies that maintain low levels of emotional awareness (e.g., avoidance of emotional experiences) (Cheavens et al., 2005). These individuals may, therefore, be less likely to be aware of their emotional experiences and they may not accurately notice their current emotional experiences. They may rely on their general beliefs regarding emotional experiences to report current emotional experiences.

Consequently,

4. The higher the score on the borderline symptoms scale, the more the content of current emotional experiences would reflect the content of general emotional experiences.

As previously reviewed, mindfulness should theoretically be associated with greater awareness, including emotional awareness (Bishop et al., 2004). In fact, emotional awareness may be a mechanism through which mindfulness can alter emotional experiences. Mindfulness should, then, be related to autonoetic awareness for autobiographical present or more specifically emotional awareness of the present moment. If participants are aware of their current emotional experiences, then the content of these experiences may not necessarily reflect content of one’s general beliefs of emotional experiences (Conner-Christensen, 2003). Consequently,
5. The higher the score on the mindfulness scale the less the content between current emotional experiences would reflect the content of general emotional experiences.

As previously stated, young adults with borderline symptoms may not be fully aware of their current emotional experiences. Being mindful, on the other hand, is being attentive to and aware of one’s current emotional experiences (Baer, 2003). If a person reports higher levels of borderline tendencies as well as higher degrees of mindfulness, he or she may be less likely to avoid emotions and he or she may attend to his or her inner experiences instead. This person would then be more aware of his or her emotions in the moment present. Consequently,

6. The more borderline features are related to the tendency to be mindful, the more the content of current emotional experiences should differ from the content of emotions in general.

*Emotion Differentiation*

A specific emotional awareness deficit previously associated with borderline patients is a difficulty differentiating among emotional experiences (Levine et al., 1997). This tendency may again be present because these individuals avoid attending to their emotions (Cheavens et al., 2005) which may limit their knowledge regarding their emotional experiences. They may, for example, have difficulty noticing subtle differences between emotional experiences or have difficulty naming these subtle differences. Young adults with borderline features have similar awareness deficits
(Leible & Snell, 2004). It is then possible the more a person reports borderline features, he or she may have difficulty differentiating among emotional experiences as well. To test this idea, I used Feldman et al. (2001) and Tugade et al., (2004) method of assessing emotion differentiation. Based on Feldman et al. (2001) and Tugade et al., (2004) lower scores on the indexes of differentiation or granulation imply more differentiation while higher scores on the indexes of differentiation or granulation would indicate less differentiation. Consequently,

7. Higher scores on the borderline features scale should be associated with lower levels of emotion differentiation (i.e., higher correlations among similarly-valenced affects).

Mindfulness tendencies should instead reflect a greater ability to differentiate between emotional experiences because being mindful is paying attention to and being aware of inner experiences (Baer, 2003). The more mindful a person is the more this person may then notice subtle differences between their emotional experiences. Consequently,

8. Higher scores on the mindfulness scale should be associated with higher levels of emotion differentiation (i.e., lower correlations among similarly-valenced affects).

However, similarly, if a person who reports higher levels of borderline features also has a tendency to be mindful then
The more mindfulness is associated with borderline features, the higher scores on the borderline feature scale would predict lower scores on the indices of emotion differentiation.
CHAPTER II

Method

Participants

One hundred and three undergraduate students from the subject pool at Kent State University were recruited to participate in this study. Seven participants were removed due to incomplete data. The final sample included 70 females and 26 males. Eighty participants were Caucasian, 8 were African American, 5 Asian, 2 Hispanic, 1 “other.” The average age of the sample was 19.19 (SD = 2.21). No specific selection based on borderline features was used. Each student received extra credit for a psychology course contingent on their participation. Participants received 2 points for the first session, 1 point for the second session, and up to 7 points for the experience sampling part of the study. Credit earned for the experience sampling part of the study was dependent on the number of responses provided on the palm pilot.

Procedure

The present study was approved by the Human Subjects Review Board at Kent State University. The study included an initial and last session, and a week of experience sampling. During the initial session in the lab, participants were informed that the study in which they were about to participate would last one week and would investigate
change in emotional states over time in college students. During that session, all participants provided informed consent and completed the Five Facet Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006), and the Borderline Personality Features Scale (PAI-BOR; Morey, 1991). Participants also answered a brief questionnaire (21 questions) on how they feel in general. Participants also recorded how they felt in general (21 questions) a second time, during the last session of this study. Because the focus of the study was on continuous emotional processes, a Palm Pilot study was conducted to assess people’s ongoing emotions in an ecologically-valid manner. Following completion of the questionnaires, each participant received a Palm Pilot device, an instrument that was used with a program (The Purdue Momentary Assessment Tool, PMAT; Weiss, Beal, Lucy, & MacDermid, 2004) to conduct the current experience sampling study. To set up the Palm Pilot, the participants provided their preferred onset time for the Palm Pilot during the initial session, so to only signal each participant during their waking hours.

For the experience sampling part of the study, participants recorded their emotions at a random beep scheduled approximately every 2 hours and for a total of 6 beeps throughout the day. Each signal was set to last up to 60 seconds. After these 60 seconds, the participants were unable to complete the assessment. If he or she missed the recording of emotional experiences at one beep, he or she had to resume at the following beep. At the beep, each participant was to answer a brief questionnaire (21 questions) regarding their current emotional state. Compliance was determined by a
log the Palm Pilot device keeps. This log recorded times of each signal and responses given to the questions. The participants could not access the time and content log. The volume of the beep was set at a tone that was not too disruptive to students in class. Participants were instructed to carry the Palm Pilot device on them as often as possible.

**Questionnaire Measures**

*Borderline personality features.* The Personality Assessment Inventory (PAI; Morey, 1991) includes a scale assessing borderline personality disorder features, the Borderline Personality Features Scale. This scale includes 24-items defining 4 subscales (i.e., affective instability, identity problems, and negative relationships and self-harm), four features commonly found in BPD. Items include, for example, “My mood can shift quite suddenly” (affective instability); “I often wonder what I should do with my life” (identity problems); “My relationships have been stormy” (negative relationships); and “When I’m upset, I typically do something to hurt myself” (self-harm). Each subscale contains 6 items. Response options are 0 (false, not at all true), 1 (slightly true), 2 (mainly true), and 3 (very true). A cut-off greater or equal to 38 (raw score) or a T score greater or equal to 70 on the total scale score can be used to determine participants with borderline features (Morey, 1991; Tolpin et al. 2004; Trull, 1995; Zeigler-Hill & Abraham, 2006). This score represents two standard deviations above the mean (Tolpin et al., 2004). This cut off has previously been used successfully to identify 13 to 15 % of young adults with borderline features in college samples (i.e., Morey, 1991; Tolpin et al. 2004; Trull, 1995; Zeigler-Hill & Abraham, 2006). Even though such scores reveal the
presence of borderline features in the general clinical population, it does not necessarily represent a diagnosis of BPD (Zeigler-Hill & Abraham, 2006). This scale can also be used as a continuous measure and was used as such in the present study. Cronbach’s alpha for this scale in the current sample was .64, which was low compared to previous studies utilizing this scale. Alphas for the PAI, borderline scale are commonly greater than .80 (e.g., Trull, 1995; Zeigler-Hill & Abraham, 2006; Wupperman, 2007). The average of the PAI, borderline scale in this sample (see Table 1) was also low compared to Zeigler-Hill and Abraham’s study who reported an average of 29.03 and a standard deviation of 12.06 as well as Trull (1995)’s study who had an average of 26.63 and a standard deviation of 10.68. The current study had a similar average to Wupperman’s study with an average of 24.58, and a standard deviation of 9.68. The current sample appeared to have a low average for the PAI, borderline scale with less deviation from the mean than most other studies (See items of the borderline features subscale in Appendix A).

**Five Facet Mindfulness Questionnaire.** The Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006) assesses a general tendency to be mindful. Baer et al., (2008) have shown that as a person’s experience with meditation increases, FFMQ scores also increase. Furthermore, these same authors have indicated that scores on the FFMQ subscales were associated to less psychological symptoms and greater well-being. More specifically, Baer et al, (2006) have shown that the FFMQ was related to more emotional intelligence, less emotion regulation difficulties, and less experiential avoidance. This
scale contains 39 items that are divided into 5 subscales that assess 5 facets of mindfulness. One facet is nonreactivity to inner experiences. This subscale includes items such as “I perceive my feelings and emotions without having to react to them.” Another facet is observing, noticing, attending to sensations/perceptions/thoughts/feelings which is composed of items such as “when I’m walking, I deliberately notice the sensations of my body moving.” Acting with awareness/automatic pilot/concentration/nondistraction is a third facet and it includes items such as “I rush through activities without being really attentive to them.” The fourth facet is describing/labeling and contains items such as “I’m good at finding the words to describe my feelings.” The last facet is nonjudging of experience and it includes items such as “I disapprove of myself when I have irrational ideas.” The nonreactivity scale is composed of 7 items and the other 4 scales include 8 items. Each scale is based on a Likert scale ranging from 1 (never or very rarely true) to 5 (very often or always true). Cronbach’s alpha coefficient for the current sample was .88 for the full scale. Cronbach’s alpha for the full scale showed good reliability similar to that reported in Van Dam, Earleywine, and Danoff-Burg’s (2009) study. Average for the total FFMQ scale in the current study (see Table 1) was very similar to Van Dam et al (2009) and Baer’s studies. (See items of the FFMQ in Appendix B).

*Current emotional experiences.* During the experience sampling portion of the study, participants used the Palm Pilot to report their current subjective experiences by answering “How do you feel right now?” The emotions selected for this study were
included because they vary on the dimension of pleasantness-unpleasantness. Having this dimension is important as findings may differ between positive and negative emotions (Robinson & Clore, 2002b). The emotions in this study are also representative of both high and low activation emotions. Specifically, the positive emotions in this study included interested, happy, content, peaceful, calm, overjoyed, fascinated, curious, comfortable and proud. The negative emotions were sad, angry, ashamed, nervous, irritated, enraged, depressed, miserable, fearful, afraid, and guilty. These lists of emotions were composed with emotion items (i.e., interested, proud, ashamed, nervous, afraid and guilty) from the PANAS (Watson et al. 1988). “Happy,” “content,” “calm,” “sad,” “depressed” and “miserable” were emotion items taken from Feldman Barrett and Russell (1998). In addition, borderline patients often report emotions related to anger, sadness, and anxiety (DSM-IV-TR, APA, 2000; Ebner-Priemer, Welch et al., 2007; Koenigsberg et al., 2002; Jang, Dick, Wolf, Livesley, & Paris, 2005). Ebner-Priemer, Welch et al. (2007) also indicated that happiness and interest were emotions that borderline patients sometimes report. Moreover, individuals with borderline symptoms are believed to be emotionally reactive so that they report intense emotional experiences (Linehan et al., 2007). Consequently, some emotion items (irritated, angry, enraged, fearful, overjoyed, fascinated, curious, peaceful, and comfortable) were included to represent the emotions that individuals with borderline symptoms may report as well as to indicate emotions with various levels of intensity. For instance, “irritated,” “angry,” “enraged” are emotions related to anger but with different
intensity. Participants reported these emotions on a 7-point-Likert scale ranging from 1 (not at all) to 7 (a great deal). For the current sample, Cronbach’s alpha coefficient for mean of negative and positive emotions were .89 and .90, respectively. (See the emotion items in Appendix C).

General emotional experiences. Participants reported their general emotional experiences by answering “How do you generally feel?” during the first and last lab sessions. The emotions questionnaire used the same scale as the current emotional experiences including the same positive and negative emotions described above. This scale was also a 7-point-Likert scale ranging from 1 (not at all) to 7 (a great deal). The Cronbach’s alpha coefficients for negative and positive general emotions were .87 and .87, respectively. (See items of general emotion in Appendix C).

Stressful life events. The College Student’s Stressful Event Checklist (Holmes & Rahe, 1967) is a checklist of life events that requires individuals to make changes in their lives; changes that create stress. This checklist contains 32 possible stress producers, including “death of a close family member.” Participants reported if an event happened in their life recently or was about to happen soon. Mild stress corresponds to a score of 150 or less. Moderate stress is associated with a score between 150 to 300 and severe stress corresponds to a score over 300. The current study indicated that the sample experienced a high level of stress with a mean of M = 310.84 and a standard deviation of SD = 177.13. This average appears high as other samples using the 43 items showed a lower average (e.g., Meadors & Lamson, 2008; Thorsteinsson & Brown, 2009). The
Cronbach’s alpha coefficient for the college student’s stressful event checklist for this study was .73.

**Analyses**

*Construction of emotional lability index.* Indices of emotion lability were composed using mean score within-subject standard deviations derived from each current emotion rating across the 7 days (6X7). The within subject standard deviation has previously been used as a measure of instability (Jahng, Wood, & Trull, 2008) in individuals diagnosed with BPD and individuals who endorsed higher levels of borderline features (e.g., Cowdry, Gardner, O’Leary, Leibenluft, & Rubinow, 1991; Zeigler-Hill & Abraham, 2006). The standard deviation of each negative emotion across all of a participant’s assessments was calculated prior to averaging them across all negative emotions (11 negative emotions) to form an index of negative emotion lability. This approach – calculating the within-person standard deviation of each discrete emotion item prior to averaging the standard deviations across each valence category – was used because it does not assume that each discrete emotion item fluctuates across assessments in the same manner as other discrete emotion items of the same valence. The alternative approach – averaging the discrete emotion items of a particular valence at each assessment, prior to calculating the within-person standard deviation of this average across all assessment assumes that each emotion changes in a similar manner as the other emotions of the same valence. Thus, the current method used to calculate within-subject standard deviations is better able to capture the degree to which discrete
emotions of a particular valence tend to change over time. Because individuals with borderline features or a diagnosis of BPD have mainly showed lability of only a few discrete emotions (i.e., anger, anxiety, depression) (DSM-IV-TR, APA, 2000; Ebner-Priemer, Welch et al., 2007; Koenigsberg et al., 2002; Jang, Dick, Wolf, Livesley, & Paris, 2005), composing the standard deviation of each emotion prior to averaging each individual standard deviation would help maintain each discrete emotion’s variability. Standard deviations of positive emotions were also averaged across the positive emotions (10 positive emotions) to form an index of positive emotion lability. Higher scores on these indices reflect the presence of greater emotional lability. Lower scores on these indices show less emotional lability. Cronbach’s alpha coefficient for standard deviation of negative emotions was .91 and .89 for positive emotions for the current sample.

Construction of semantic infusion index. To understand the role of emotional awareness in the relationship between mindfulness and borderline features, indices of semantic infusion were created based on Conner-Christensen’s (2003) methodology. These indices have been suggested to reflect the extent to which individuals refer to general emotional experiences to report current emotional experiences. Because it is possible that participants may respond differently to negative and positive emotional experiences (Robinson & Clore, 2002b), an index of semantic infusion was composed separately for positive and negative emotions. The average general emotional experiences were computed by averaging the scores of the two measures of general
emotional experience ratings for each emotion. Out of 96 participants, eighteen
participants only completed the first rating of general emotions. For these participants,
the scores of the first rating of general emotion were used instead of the average of the
two ratings to compose the indices of semantic infusion. The total negative emotion
ratings at time one were correlated with total negative emotion ratings at time two, $r$
$(78) = .43, p < .001$ as were total positive emotions at time one and time two, $r (78) =$
$.48, p < .001$. (See Table 5 for individual emotion’s correlations). Furthermore, t-tests
were conducted between general emotions of the first ratings and second ratings. In
general, the first ratings of general emotions were higher than the second ratings.
However, all subsequent analyses reported in this dissertation do not change if only the
first rating of emotion is used for all participants. (See correlations and t-test results in
Table 5). The average of current emotional experiences was also computed for each
emotion with the scores of online reporting of current emotional experience (6 X 7)
ratings. Following Conner-Christensen’s (2003) procedures, these averages were
standardized for the general emotional experiences and the emotions felt in the present
moment. The absolute differences between online scores of current emotions and
general emotional experiences were then computed for each emotion. The absolute
difference scores were averaged across scores of each negative emotional experience to
form the index of semantic infusion for negative emotional experiences. The absolute
difference scores of positive emotion ratings were averaged as well to form the index of
positive semantic infusion for positive emotional experiences. Thus, using this method,
higher differences according to each index reflect lower semantic infusion or lesser content relationship between online and general emotional responding. Lower scores on the semantic infusion index indicate greater semantic infusion or more content similarity between general emotions and current emotional experiences.

*Construction of emotional differentiation index.* To assess if the specific emotion awareness deficit related to higher levels of borderline features is related to a difficulty in discriminating between emotional experiences, indices of emotions differentiation were composed. These indices were composed using only the current emotional experiences ratings taken from the experience sampling portion of the study. Feldman Barrett et al. (2001) proposed that high correlations between similarly-valanced emotional experiences indicate lower differentiation, whereas low correlations among similarly-valanced emotions indicate high differentiation between emotional experiences. In other words, lower correlations among emotional experiences would indicate that an individual could differentiate between distinct emotional experiences and have access to the knowledge each emotion brings (Feldman Barrett et al., 2001). Following Tugade et al.’s (2004) method of computing an emotion differentiation index, intraclass correlations with absolute agreement were used to compose the indices of positive emotion differentiation and negative emotion differentiation. The range of values for these indices is 0 to 1 with 0 indicating high differentiation, whereas values closer to 1 indicate low emotion differentiation.
Identification of covariates. Age, gender, and ethnicity were assessed as possible covariates. Chi-square tests were performed to assess the difference in gender and ethnicity in the present sample. Independent t-tests were then carried out to evaluate possible effects of gender and ethnicity on mindfulness and borderline tendencies, emotional lability, semantic infusion, and emotional differentiation. Descriptives of the variables are included in Table 1. Correlations between covariates and main study variables are described in Table 2. Results of the independent t-tests are presented in Table 4.

Hypothesis testing. To assess the degree to which mindfulness tendencies and borderline features are related to emotional lability, emotional awareness, and emotional differentiation, Pearson correlation and regression analyses were performed. For the regression analyses, the variables of mindfulness and borderline features were centered (cf., Aiken & West, 1994) and a mindfulness x borderline features interaction term was created to test the moderation hypotheses (i.e., hypotheses 3, 6, and 9). Borderline features was the predictor variable whereas mindfulness was tested as the moderator for each regression analysis.
CHAPTER III

Results

Descriptive Statistics

Measures of semantic infusion and emotion differentiation were not normally distributed and exhibited a significant positive skewness. Because these measures were positive and included the value 0, square root transformations were performed and resulted in a more normal distribution.

Descriptive statistics of each variable are included in Table 1. Correlations between variables are described in Table 2. Correlation between variables and the subscales of the PAI borderline features scale and FFMQ subscales are presented in Table 3. Table 4 indicates the results of the independent t-tests on variables. Table 5 reviews the correlations and dependant t-tests between each general emotion at the first and second rating.
Table 1

Means, standard deviations, and range of variables and covariates

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M indicates Mean  
SD indicates Standard Deviation  
PE indicates Positive Emotion  
NE indicates Negative Emotion  
Sqrt indicates Square Root
### Table 2
Correlations of variables and covariates

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*Indicates p ≤ .05
BOR indicates Borderline Features
NE indicates Negative Emotion
PE indicates Positive Emotion
Differ indicates Differentiation
Table 3

Correlations between variables, covariates, and PAI-BOR and FFMQ factors

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<th>BOR-A</th>
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</table>

*indicates p ≤ .05

BOR indicates Borderline Features
NE indicates Negative Emotion
PE indicates Positive Emotion
Differ indicates Differentiation
Table 4

T-tests for gender and ethnicity on variables, PAI-BOR and FFMQ factors, and covariates

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</table>

*indicates p ≤ .05
S indicates Stressful
BOR indicates Borderline Features
NE indicates Negative Emotion
PE indicates Positive Emotion
Differ indicates Differentiation
Ethnicity was coded so that Caucasian = 1 and Others = 0
Gender was coded so that Female = 0 and Male = 1
Females were more compliant than male participants
Table 5

Correlations and T-tests between general emotions during the first rating (T1) and the second rating (T2)

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<td>.46*</td>
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*indicates p ≤ .05

T1 * T2 indicates the correlation between general emotions during the first rating and the second rating

T-test represents the results of the dependent t-tests between general emotions during the first rating and the second rating
Demographic Differences

Older age was associated with reports of mindfulness, $r (96) = .24$, $p = .02$, but age was not significantly associated with any other measure assessed. Age and gender did not significantly predict emotional measures and were therefore not included in subsequent analysis. Regarding ethnicity, the current sample only had a few cases ($N = 16$) reporting ethnicity other than Caucasian ($N = 80$); therefore, individuals who reported ethnic background other than Caucasian were aggregated to compose one group “Other.” Being Caucasian or “Other” did not affect reporting on the measures assessed and was therefore not included in subsequent analyses. (See Table 2, Table 3, and Table 4).

Compliance rate was calculated by dividing the number of responses given from each participant to the Palm Pilot by the total number of possible responses. The overall compliance rate for the current emotion ratings on the palm pilot was $M = .54$ ($SD = .19$) for the present sample. Female participants showed greater compliance rate than male participants, $t (94) = 2.06$, $p = .04$. However, because compliance rate was not related to emotion variables in a consistent manner, compliance was not included in the analyses. (See Table 2 and 3 for correlations between compliance and variables).

As noted previously, participants received credits for their psychology course contingent on the number of responses provided to the Palm Pilot. Participants who did not provide any ratings in the experience sampling portion of the study were not included in analyses. To examine whether individual differences in compliance could
have biased the findings reported in this dissertation, all analyses involving current emotions were conducted in two ways. First, as reported herein, analyses were conducted without weighting the analyses by level of compliance. Second, analyses were reconducted with weighting by levels of compliance. Findings did not differ between these two approaches, suggesting that the pattern of findings was not likely an artifact of varying levels of compliance.

Borderline features was associated with greater stressful life events, $r(87) = .27$, $p = .01$, as was greater negative emotion lability, $r(87) = .28$, $p = .01$, and negative semantic infusion, $r(87) = .25$, $p = .02$. No other variable shows a relationship with the experience of stressful life events. (See Table 2).

**Borderline Features, Mindfulness, and Emotion Lability**

*Borderline features and emotion lability.* Pearson correlations were performed to assess the association of borderline features and emotion lability. Consistent with hypothesis 1, borderline features were positively related to the index of negative emotion lability, $r(96) = .20$, $p = .05$ and positively related to the index of positive emotion lability, $r(96) = .25$, $p = .02$, so that the more a person reported borderline features the more the person experienced negative and positive emotion lability.

*Borderline features and mindfulness tendency.* A Pearson correlation was carried out to assess the relationship between borderline features and mindfulness tendency. Consistent with hypothesis 2, borderline features were negatively associated with
mindfulness tendencies, \( r (96) = -.27, p = .01 \), so that the more a person endorsed borderline features, the less mindful the individual was.

Mindfulness as a moderator between borderline features and emotion lability. A regression analysis was performed to assess mindfulness as a moderator between borderline features and emotional lability. (See Table 6 and 7). Contrary to hypothesis 3, mindfulness did not significantly moderate the relationship between borderline features and either emotion lability.
Table 6

Summary of the hierarchical regression analysis for borderline features predicting negative emotion lability

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<th>β</th>
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Note. $R^2 = .04$ for Step 1 (p=.05), $\Delta R^2 = .11$ for Step 2 (p<.01). $\Delta R^2 = .00$ for Step 3 (p=.85)

*p ≤ .05
Table 7

Summary of the hierarchical regression analysis for borderline features predicting positive emotion lability

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<td>.03</td>
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</table>

Note. \( R^2 = .06 \) for Step 1 (\( p=.01 \)), \( \Delta R^2 = .04 \) for Step 2 (\( p=.04 \)). \( \Delta R^2 = .00 \) for Step 3 (\( p=.77 \))

* \( p \leq .05 \)

**Borderline Features, Mindfulness, and Semantic Infusion**

*Borderline features and semantic infusion.* Pearson correlations were computed between borderline features and the indices of semantic infusion (i.e., similar emotional content between general and current emotions). Contrary to hypothesis 4, borderline features were positively associated with the index of negative semantic infusion, so that the more a person reported borderline features, the less semantic infusion the
individual showed for negative emotions, \( r (96) = .27, p < .01 \). Also contrary to hypothesis 4, no association was present between borderline features and the index of positive semantic infusion, \( r (96) = .06, p = .57 \).

**Mindfulness and semantic infusion.** Pearson correlations were used to assess the relationship between mindfulness tendencies and the indices of semantic infusion. Contrary to hypothesis 5, mindfulness tendencies were negatively associated with the index of negative semantic infusion, \( r (96) = -.44, p < .001 \), so that the more mindful a person was the more semantic infusion the person revealed. Also contrary to hypothesis 5, mindfulness tendencies were not significantly related to the index of positive semantic infusion, \( r (96) = -.02, p = .82 \).

**Mindfulness as a moderator between borderline features and semantic infusion.** Regression analyses were performed to assess mindfulness tendency as a moderator between borderline features and semantic infusion. (See Table 8 and 9). Contrary to hypothesis 6, mindfulness did not moderate the relationship between borderline features and negative or positive semantic infusion.
Summary of the hierarchical regression analysis for borderline features predicting negative semantic infusion

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Note. $R^2 = .07$ for Step 1 ($p<.01$), $\Delta R^2 = .14$ for Step 2 ($p<.001$). $\Delta R^2 = .00$ for Step 3 ($p=.7$)

*p ≤ .05
Table 9

Summary of the hierarchical regression analysis for borderline features predicting positive semantic infusion

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Note. $R^2 = .00$ for Step 1 ($p = .57$), $\Delta R^2 = .00$ for Step 2 ($p = .94$). $\Delta R^2 = .00$ for Step 3 ($p = .82$)

*p ≤ .05

Borderline Features, Mindfulness, and Emotion Differentiation

Borderline features and emotion differentiation. Pearson correlations were performed to assess the relationship between borderline features and the indices of emotion differentiation, or how well a person can discriminate between his or her discrete emotions. Contrary to hypothesis 7, borderline features were not significantly correlated with the negative index of emotion differentiation, $r (96) = .05$, $p = .65$. 
Similarly, contrary to hypothesis 7, borderline features were not significantly correlated with the index of positive emotion differentiation, $r (96) = -0.04, p = .71$.

**Mindfulness and emotion differentiation.** Pearson correlations assessed the relationship between mindfulness tendencies and the indices of negative emotion differentiation. Consistent with hypothesis 8, being mindful was significantly negatively related to the index of negative emotion differentiation $r (96) = -0.22, p = .03$, so that the more mindful a person is, the more emotion differentiation he or she showed. Similarly, consistent with hypothesis 8, being mindful was negatively related to the index of positive emotion differentiation $r (96) = -0.23, p = .02$, showing more emotion differentiation for positive emotions as well.

**Mindfulness as a moderator between borderline features and emotion differentiation.** Regression analyses were performed to assess the effect being mindful has on the relationship between borderline features and emotion differentiation (See Table 10 and 11). Contrary to hypothesis 9, mindfulness did not moderate the relationship between borderline features and negative or positive emotion differentiation.
Table 10

Summary of the hierarchical regression analysis for borderline features predicting negative emotion differentiation

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Note. $R^2 = .00$ for Step 1 ($p=.65$), $\Delta R^2=.05$ for Step 2 ($p=.03$). $\Delta R^2=.01$ for Step 3 ($p=.45$)

*p ≤ .05
Table 11

Summary of the hierarchical regression analysis for borderline features predicting positive emotion differentiation

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Note. $R^2 = .00$ for Step 1 ($p=.71$), $\Delta R^2 = .06$ for Step 2 ($p = .01$). $\Delta R^2=.00$ for Step 3 ($p=.79$)

*p ≤ .05

**Borderline Features and Specific Emotion Lability**

To ensure that a comprehensive measure of affect was present and to understand more specifically the emotion lability associated with borderline features, the present study included low-activation emotions such as “sad” for negative emotions and “calm” for positive emotions. Borderline features were associated with greater lability of being overjoyed, $r (96) = .23, p = .02$, but also greater lability of the low-
activation positive emotions of being comfortable, $r (96) = .26, p = .01$, calm, $r (96) = .26, p = .01$, and peaceful, $r (96) = .19, p = .06$. Borderline features were also related to greater lability of being sad, $r (96) = .22, p = .03$ and miserable, $r (96) = .25, p = .01$. These findings indicate that borderline features were mainly associated with low and not high-activation positive and negative emotion lability.
CHAPTER IV

Discussion

Summary of Findings

Borderline features were associated positively with negative emotion lability as well as positive lability. Borderline features were also related to less mindfulness tendencies. However, contrary to hypotheses, mindfulness tendencies did not moderate the relationship between borderline features and either emotional lability. When considering specific emotional awareness, results were also unexpected. The extent to which a person endorsed borderline features was related to lower negative semantic infusion while mindfulness tendencies were associated with higher negative semantic infusion. Positive semantic infusion was not related to either borderline features or mindfulness tendencies. Mindfulness, again, did not moderate the relationships between borderline features and either negative or positive semantic infusion. Furthermore, borderline features did not significantly relate to either emotion differentiation. Mindfulness tendencies, however, were positively associated with both negative and positive emotion differentiation. Mindfulness tendency did not moderate the relationship between either negative or positive emotion differentiations.
Emotion Lability

Similar to previous studies, the present study reveals the presence of negative emotion lability in relation to borderline features (Tolpin et al., 2004; Zeigler-Hill & Abraham, 2006). Unlike Tolpin et al. (2004), but similar to Zeigler-Hill and Abraham (2006), borderline features were also related to positive lability. The present study assessed emotional lability using a Palm Pilot reporting current emotions 6 times per day for 7 days unlike previous studies (Tolpin et al., 2004; Zeigler-Hill & Abraham, 2006) where emotions were only assessed once per day. Assessing emotions multiple times a day may provide a more accurate picture of the emotion lability experienced by individuals who report higher levels of borderline features.

Furthermore, including low-activation emotions for both positive and negative emotions may also provide a more accurate description of the emotion lability present in individuals who reported higher levels of borderline features. In fact, borderline features were mainly related to low-activation positive (e.g., calm and comfortable) and negative (e.g., sad and miserable) emotional lability.

In sum, the present findings provide further support for negative and positive emotion lability as a characteristic associated with borderline features. It also indicates that including low activation emotions would provide a more accurate assessment of the emotion lability associated with borderline features. The presence of emotion lability also provides a basis for future investigations to understand its relationship with emotion awareness.
Awareness

The present study sheds light on some aspects of mindfulness and borderline tendencies in regards to emotional awareness. Borderline features were related to lower levels of mindfulness similar to Wupperman’s (2007) findings, indicating that higher degrees of reporting borderline features were associated with less awareness of the emotions experienced in the present moment. Mindfulness, however, did not affect the relationship between borderline features and emotion lability. When looking at the specific relationship between borderline features, mindfulness, and specific awareness the findings were mixed.

Semantic infusion. The findings related to semantic infusion for negative emotions were unexpected as borderline features were related to lower levels of semantic infusion and mindfulness tendencies were related to higher levels of semantic infusion. Findings indicate that higher levels of borderline features were associated with greater awareness of the emotions experienced in the present moment while mindfulness tendencies were related to lower awareness of how the person feels right now. In other words, it seems that the more a person endorses borderline features the more he or she has autonoetic awareness or awareness of the present moment. On the other hand, according to the present findings, mindfulness tendencies are less likely related to autonoetic awareness or less awareness of emotions experienced in the present moment as mindfulness was related to greater semantic infusion. These
findings appeared counterintuitive as being mindful is by definition being aware in the present moment (Bishop et al., 2004).

In fact, interpreting the measure of semantic infusion in the present study can be rather difficult. When composing the index of emotion lability, we assessed how much change is present when comparing reports of a current emotion (e.g., anger) compared to the mean of that same emotion (e.g., average of current scores of anger). If an individual shows higher degrees of emotion lability (i.e., lability of anger), he or she is likely to show greater variability when comparing this emotion (i.e., anger) to other measures of that same emotion such as “How one reports anger in general.” Consequently in the present study, if an individual shows greater negative emotion lability, he or she is also likely to show lower negative semantic infusion (i.e., greater difference or lability between current emotion and general emotion). In fact, in the study, borderline tendencies were related to greater negative emotion lability, showing variability in current negative emotional experiences as well as lower semantic infusion showing greater variability between their current emotions and general emotions. On the other hand, mindfulness was associated with lower levels of negative emotion lability as well as greater levels of semantic infusion or less variability between current emotions and general emotions. In the context of an experience sampling study such as this study, semantic infusion may act as another way of assessing negative emotion lability and may not necessarily specifically define autonoetic awareness of the present moment as originally proposed.
Furthermore, if the measure of negative semantic infusion is a form of emotion lability, then factors related to negative emotion lability should be related similarly to semantic infusion. In fact, stressful life events were significantly correlated with borderline features, greater negative emotion variability, and lower negative semantic infusion. Additionally, mindfulness was unrelated to stressful life events, negatively related to negative emotion lability, and related to greater semantic infusion or less variability between current emotions and general emotions. Findings may indicate that the extent a person reports higher levels of borderline features is associated with more stressful life events, but endorsing higher levels of borderline features may also show more emotion reactivity as greater lability and less semantic infusion was present. Higher levels of mindfulness tendencies may show less emotion reactivity as mindfulness was related to less emotion lability and more semantic infusion.

However, the same relationship does not fit the findings related to positive emotions. Even though borderline features were associated with greater positive emotion lability, no relationship with positive semantic infusion and borderline features was present. Similarly, mindfulness tendencies were related to lower levels of positive emotion lability, but did not show an association with positive semantic infusion. The results appear to indicate that neither reporting borderline nor mindfulness tendencies is associated with autonoetic awareness or awareness of the present moment for positive emotions. As Robinson and Clore (2002b) noted, it is possible that participants respond differently to positive and negative emotions. The present findings may reflect
differences in processing negative emotions versus processing positive emotions.

Cacioppo, Gardner, and Berntson (1999) proposed that there are two independent and distinct dimensions of affect. The first dimension relates to the appetitive or positive affect and the second dimension to the aversive or negative emotions. The distinction between how positive and negative affect is processed appears to be supported by neuropsychological findings. For instance, Davidson (1998) found positive emotions to be related to the activity in the left frontal cortex whereas negative emotions were related to activity in the right frontal cortex. The findings regarding semantic infusion in the study could be the result of this difference between positive and negative emotion processing. For example, in this study, it seems that stressful life events affect positive and negative emotion differently. Stressful life events were related to negative emotion lability and negative semantic infusion, but were unrelated to positive emotion lability or positive semantic infusion.

In any case, interpreting semantic infusion as a measure of autonoetic or emotional awareness of the present moment is difficult. No previous study utilized this method to assess semantic infusion in comparing current with general emotions. Robinson and Clore (2002 b) assessed, in a lab study, episodic and semantic emotion knowledge but used a different method (i.e., judgment latencies and priming paradigms) and they did not specifically look at the difference between current and general emotions. The method of assessing semantic infusion used in this study was based on Conner-Christensen’s (2003) methodology, but Conner-Christensen (2003)
utilized semantic infusion in relation to report of current self-esteem and general beliefs about one’s self-esteem. This study was the first study to assess semantic infusion for current emotion based on the differences between general and current emotions. However, as previously noted, semantic infusion as measured by the difference between current emotion and general emotion may be difficult to interpret as it could also reflect other factors (e.g., negative emotion lability).

Emotion differentiation. Findings regarding emotion differentiation do not appear to follow the same pattern as semantic infusion. As expected, mindfulness tendencies were associated with more differentiation for both negative and positive emotional experiences. Borderline features, however, were not associated with either emotion differentiation. When assessing emotion differentiation, mindfulness tendencies appear to reflect greater awareness of current emotions by being able to differentiate between discrete emotions. A tendency to differentiate between emotional experiences is theoretically related to effective emotion regulation (Larsen, 2000; Laurent & Pavio, 2001) and found to correlate with effective emotion regulation tendencies (Tugade et al., 2004).

Borderline features did not reflect this awareness of discrete emotion. The non-association of borderline features with either emotion differentiation may be due to having only a few individuals endorsing borderline features. In fact, only 4 individuals reported borderline symptoms high enough (equal or greater than 38) to indicate the presence of a borderline diagnosis. The present findings may be specific to the present
sample and not be representative of individuals with borderline features. In any case, borderline features were not associated to the awareness measure indicating the ability to differentiate between current emotional experiences.

**Implications for the Study**

As a whole, the findings appear to indicate that the extent a person reports borderline features was less likely to be associated with emotional awareness and awareness of the present moment. Borderline features was negatively associated with mindfulness and not associated with any measures of emotion differentiation. The findings also suggest that mindfulness is related to emotional awareness, especially the ability to differentiate between current emotional experiences. Mindfulness was related to the measures of emotion differentiation for both positive and negative emotions.

Previous research findings also support mindfulness as a measure of awareness (e.g., Brown & Ryan, 2003). Psychological treatments including mindfulness training have also been helpful in decreasing emotional difficulty in individuals diagnosed with borderline symptoms (i.e., Bohus et al., 2004; Linehan et al., 1991; Linehan et al., 2006). A common factor among the treatments is learning to label discrete emotion (Gratz & Gunderson, 2006; Linehan, 1993a; 1993b). Having difficulty differentiating between emotional experiences is also a deficit in individuals diagnosed with BPD (Ebner-Priemer, Welch et al., 2007; Levine et al., 1997; Linehan, 1993a; Wolff et al., 2007). The findings of the present study indicate that mindfulness tendencies were related to the
ability to label distinct emotions, while borderline features were not, which may represent a deficit for individuals who endorse higher levels of borderline features.

Findings regarding negative semantic infusion are confusing as borderline features in this study were related to more emotional awareness while mindfulness tendencies are not. It may be that negative semantic infusion represents a form of negative emotion lability and may be influenced by factors that also affect negative emotions. In fact, negative semantic infusion was related to stressful life events, while emotion differentiation was not. Negative semantic infusion could also reflect partially a person’s emotional reactivity when facing an event or the ability to regulate emotion in general. It would explain why borderline tendencies were related to greater negative emotion lability and less semantic infusion, showing more emotional reactivity, while mindfulness was related to low negative emotion lability and greater semantic infusion (i.e., less change between current and general emotions or low emotional reactivity).

In sum, understanding the measure of semantic infusion in regards to emotions is needed prior to making conclusions of its meaning.

Limitations

The first limitation for the present study is that the sample was composed of a non-clinical population. Because it is a nonclinical population generalizing the findings to individuals with a full diagnosis of BPD is limited. In fact, individuals in this study may only endorse a few borderline features and not enough features to warrant diagnosis of BPD. It is even more so that the sample also only included four individuals who
endorsed borderline symptoms above the threshold of possible borderline diagnosis. It is therefore important to interpret the findings cautiously with regard to how these findings describe individuals with higher levels of borderline features and/or diagnosis of BPD. Replications of these findings are also necessary. In fact the low levels of borderline features in the current sample, could explain for example, why the relationship between borderline features did not relate to emotion differentiation. Still, understanding symptoms in a non-clinical population is important as individuals with a full diagnosis of BPD may be overrepresentative of the clinical population and comorbidity is often present and difficulty to study. Furthermore, nonclinical populations may also experience impairment in relations to the borderline features that they endorse, and the present findings shed light on how mindfulness and mindfulness training may be beneficial for nonclinical populations as well.

Furthermore, the findings in the present study are all correlational. It is therefore not possible to provide causal connection between borderline features, mindfulness, and emotion measures. Regarding findings of mindfulness and emotion differentiation, for example, it could be that individuals who often have to regulate their emotions learn to differentiate between their emotions more effectively (Feldman Barrett et al., 2001). It is important to note, however, that most of the correlations are in the expected direction, showing more lability and less mindfulness tendencies for individuals who endorse borderline features. Mindfulness tendency is also related to emotion differentiation for both negative and positive emotions a measure thought to
be and previously associated with effective emotion regulation (Feldman Barrett et al., 2001; Tugade et al., 2004). As previously noted, greater understanding regarding findings about semantic infusion are necessary before effective interpretation. Even though the findings are mainly correlational, the present study uses an experience sampling approach. An experience sampling methodology is a useful way of assessing emotion in the present moment as this method has the benefit of capturing emotions in everyday life, unlike lab studies. The present study also assessed emotions as they occurred multiple times a day, which is more likely to reflect change in emotions and therefore reveal the lability that individuals with borderline tendencies are likely to experience.

**Future Research**

Replicating the present findings especially with young adults with borderline features and with individuals diagnosed with borderline personality disorder would be important to validate the present findings. Because no moderation was significant in the present study, looking at mindfulness training instead of mindfulness tendency to assess changes in emotional experiences and understanding of emotion awareness may be necessary. Further research is also needed to assess the benefits of mindfulness (e.g., differentiating between emotions) with specific awareness deficits of individuals with borderline features in order to refine the emotional awareness training preferred for that population.
REFERENCES


APPENDIX A

Personality Assessment Inventory: Borderline Personality Features Scale
Personality Assessment Inventory: Borderline Personality Features Scale (Morey, 1991)

Affective instability – (BOR – A)

1- My mood can shift quite suddenly
2- My moods get quite intense
3- My mood is very steady
4- I have little control over my anger
5- I’ve always been a pretty happy person
6- I’ve had times when I was so mad I couldn’t do enough to express all my anger

High scores: these individuals are highly responsive emotional, typically manifesting rapid and extreme mood swings rather than more cyclic mood changes as seen in affective disorders. These individuals also tend to experience episodes of poorly controlled anger.

Identity problems – (BOR—I)

1- my attitude about myself changes a lot
2- sometimes I feel terribly empty inside
3- I worry a lot about other people leaving me
4- I often wonder what I should do with my life
5- I can’t handle separation from those close to me very well
6- I don’t get bored very easily
High scores: these individuals tend to be uncertain about major life issues and have little sense of purpose. They typically describe themselves as feeling empty, bored, or unfulfilled.

Negative relationships – (BOR – N)

1- My relationships have been stormy
2- I want to let certain people know how much they’ve hurt me
3- People once close to me have let me down
4- I rarely feel very lonely
5- I’ve made some real mistakes in the people I’ve picked as friends
6- Once someone is my friend, we stay friends

High scores: These individuals report a history of involvement in ambivalent, intense and unstable relationships. They often feel resentful and betrayed by people who were once close to them.

Self-Harm (BOR—S)

1- I sometimes do things so impulsively that I get into trouble
2- When I’m upset, I typically do something to hurt myself.
3- I’m too impulsive for my own good
4- I spend money too easily
5- I’m a reckless person
6- I’m careful about how I spend my money
High scores: These individuals are impulsive in areas that have high potential for negative consequences, such as spending, sex, and/or substance abuse. Such behavior has typically interfered repeatedly with effective social and/or occupational performance. High scorers may also be at increased risk for self-mutilation and suicidal behavior.

Likert scale:

0 (false, not at all true)

1 (slightly true)

2 (mainly true)

3 (very true)
APPENDIX B

Five Facet Mindfulness Questionnaire
Five Facet Mindfulness Questionnaire (Baer et al., 2006)

Factor 1: Nonreactivity

1- I perceive my feelings and emotions without having to react to them
2- I watch my feelings without getting lost in them
3 - In difficult situations, I can pause without immediately reacting.
4 - When I have distressing thoughts or images, I am able just to notice them without reacting.
5- When I have distressing thoughts or images, I feel calm soon after.
6- When I have distressing thoughts or images, I “step back” and am aware of the thought or image without getting taken over by it.
7- When I have distressing thoughts or images, I just notice them and let them go.

Factor 2: observing

1- When I’m walking, I deliberately notice the sensations of my body moving.
2- When I take a shower or a bath, I stay alert to the sensations of water on my body.
3- I notice how foods and drinks affect my thoughts, bodily sensations, and emotions
4- I pay attention to sensations, such as the wind in my hair or sun on my face.
5- I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.

6- I notice the smells and aromas of things.

7- I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.

8- I pay attention to how my emotions affect my thoughts and behavior.

Factor 3: Acting with awareness

1- I find it difficult to stay focused on what’s happening in the present.

2- It seems I am “running on automatic” without much awareness of what I’m doing.

3- I rush through activities without being really attentive to them.

4- I do jobs or tasks automatically, without being aware of what I’m doing.

5- I find myself doing things without paying attention.

6- When I do things, my mind wanders off and I’m easily distracted.

7- I don’t pay attention to what I’m doing because I’m daydreaming, worrying, or otherwise distracted.

8- I am easily distracted.

Factor 4: describing

1- I’m good at finding the words to describe my feelings.

2- I can easily put my beliefs, opinions, and expectations into words.

3- It’s hard for me to find the words to describe what I’m thinking. (a)
4- I have trouble thinking of the right words to express how I feel about things.

(a).

5- When I have a sensation in my body, it’s difficult for me to describe it because I can’t find the right words. (a)

6- Even when I’m feeling terribly upset, I can find a way to put it into words.

7- My natural tendency is to put my experiences into words.

8- I can usually describe how I feel at the moment in considerable detail

Factor 5: Nonjudging

1- criticize myself for having irrational or inappropriate emotions. (a)

2- I tell myself that I shouldn’t be feeling the way I’m feeling. (a)

3- I believe some of my thoughts are abnormal or bad and I shouldn’t think that way. (a)

4- I make judgments about whether my thoughts are good or bad. (a)

5- I tell myself that I shouldn’t be thinking the way I’m thinking. (a)

6- I think some of my emotions are bad or inappropriate and I shouldn’t feel them. (a)

7- I disapprove of myself when I have irrational ideas. (a)

8- When I have distressing thoughts or images, I judge myself as good or bad, depending what the thought/image is about

(a) Indicates reversed scores
APPENDIX C

Emotion items
Emotion items

Emotion Items in the study used for current and general emotions.

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<td>Comfortable</td>
</tr>
<tr>
<td>Afraid</td>
<td>Proud</td>
</tr>
<tr>
<td>Guilty</td>
<td></td>
</tr>
</tbody>
</table>

The emotions selected for this study varied on the dimensions of pleasantness-unpleasantness and low and high activation. Emotions taken from PANAS (Watson et al. 1988) were “interested,” “proud,” “ashamed,” “nervous,” “afraid,” and “guilty.” Happy, content, calm, sad, depressed, and miserable were taken from Feldman Barrett and Russell (1998). As a whole, an effort was made to include emotions that were closely
related to reports of borderline patients and be more representative of emotion experienced by that population than general emotion scales such as the PANAS (Watson et al., 1988). Therefore angry, fearful, comfortable, curious, fascinated, overjoyed, enraged, peaceful, and irritated were added. Negative emotions previously associated with BPD include anger, sadness, and anxiety (DSM-IV-TR, APA, 2000; Ebner-Priemer, Welch et al., 2007; Koenigsberg et al., 2002; Jang, Dick, Wolf, livesley, & Paris, 2005). Positive emotions previously associated with BPD included happiness and interest (Ebner-Priemer, Welch et al., 2007). Furthermore, individuals with borderline symptoms are emotionally reactive (Linehan et al., 2007) and can show high levels of intensity, so items representing various levels of emotional intensity were included. For instance, irritated, angry, and enraged represent various degrees of intensity for anger. Similarly, fearful provides an additional level of intensity with nervous and afraid. Overjoyed was added to show a different level of happiness. Fascinated and curious were to represent various intensities of interested. Finally, peaceful and comfortable were intended to represent various levels of intensity for calm.