



# An ecological momentary assessment investigation of complex and conflicting emotions in youth with borderline personality disorder

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## ABSTRACT

Non-suicidal self-injury (NSSI) is a prevalent behaviour among people with borderline personality disorder (BPD) but many aspects of the emotional changes that trigger and maintain this behaviour are unknown. This study examines the relationships between NSSI and the number of negative ('negative complex') and opposing valence ('conflicting') emotions. One hundred and seven youth (aged 15–25 years) with first-presentation BPD were assessed using a combination of self-report and ecological momentary assessment to investigate trait levels of emotional acceptance and in vivo changes in the number of negative complex and conflicting emotions before and after self-injurious thoughts and behaviours. Multilevel modelling revealed that changes in the number of negative complex emotions mirrored distress levels before and after self-injurious thoughts and behaviours, approximating a quadratic curve. Increases in the number of negative complex emotions reported prior to self-injurious thoughts and behaviours were associated with lower acceptance of negative emotions. These findings indicate that the number of negative emotions experienced contributes to distress prior to engagement in NSSI. The relationship between non-acceptance of negative emotions and negative complex emotions prior to NSSI suggests that improved emotional awareness and acceptance should be a focus for early interventions aimed at reducing self-injury.

## 1. Introduction

Emotion dysregulation, broadly defined as the inability to flexibly respond to and manage emotions (Carpenter and Trull, 2013), is a core feature of Borderline Personality Disorder (Conklin et al., 2006; Ebner-Priemer et al., 2015; Linehan et al., 2007). Non-suicidal self-injury (NSSI; Chapman et al., 2005; Klonsky, 2007) is a behaviour commonly used to regulate emotions in BPD, defined as the deliberate destruction of one's bodily tissue that is without cultural significance or lethal intent (Nock, 2009). The relationship between emotion dysregulation and NSSI has been studied in BPD with respect to the intensity of negative emotions and emotional instability. For example, both negative affect (Andrewes et al., 2016; Chapman and Dixon-Gordon, 2007; Kleindienst et al., 2008; Reitz et al., 2012), perceived rejection and dissociation (Snir et al., 2015) have been found to increase prior to NSSI and to reduce following NSSI. Emotional instability has also been identified as a predictor of NSSI in undergraduate (Selby et al., 2013) and eating disorder populations (Anestis et al., 2012; Vansteelandt

et al., 2013). Less is known, however, about the quantity of emotions experienced prior to NSSI and how other maladaptive strategies, such as non-acceptance or suppression of emotions, might contribute to the experience of multiple emotions during this time. This knowledge gap limits our understanding of the emotional experiences that contribute to engagement in NSSI. Accordingly, the focus for the current study is the relationship between multiple emotional experiences, non-acceptance of emotions and NSSI in youth with BPD.

### 1.1. Relationship between multiple emotional experiences, distress and NSSI

Multiple emotional experiences, also termed 'complex' emotions, have been associated with increased distress in three studies investigating non-BPD populations (Choi et al., 2015; Eatough et al., 2008; Pearson et al., 2008). In the first, women from a community sample described experiencing multiple emotions during expressions of aggressive behaviour (Eatough et al., 2008). In two other studies of

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chronically depressed adult outpatients, multiple emotional experiences were associated with increased rumination (Pearson et al., 2008) and a reduced ability to resolve self-criticism (Choi et al., 2015).

Only two publications have investigated multiple emotions and their association with distress in BPD (Ebner-Priemer et al., 2008, 2007). These publications relate to one experiment, in which adults with BPD ( $n = 50$ ;  $M_{\text{age}} = 31.3$  years) and healthy controls ( $n = 50$ ;  $M_{\text{age}} = 27.7$  years) identified their primary and secondary emotions from a provided list every 10- to 20-min over a 24-h period. These data were acquired using experience sampling or ecological momentary assessment (EMA), which has become the preferred method of identifying affect changes surrounding NSSI (Arney, 2012) as it largely obviates retrospective bias and maintains ecological validity (Shiffman et al., 2008). In these studies, adults with BPD exhibited multiple negative emotions (termed 'negative complex emotions'), both more commonly and at a higher intensity than healthy controls (Ebner-Priemer et al., 2007). Un-medicated adults with BPD ( $n = 10$ ) also exhibited a higher heart rate and increased vagal activity compared with healthy controls, indicating both sympathetic and parasympathetic nervous system activation (Ebner-Priemer et al., 2007). Despite the ambiguous relationship between negative complex emotions and distress found in the latter study, reports from a case series describe people with BPD as experiencing an 'avalanche' of emotions, such as internalised and externalised anger, guilt and sadness, prior to engaging in NSSI (Leibenluft et al., 1987). This suggests that people with BPD experience negative complex emotions prior to engagement in NSSI.

Ebner-Priemer and colleagues (2008) also investigated multiple emotions of opposing valences, named 'conflicting emotions', finding that their BPD group reported this emotional experience more frequently than did healthy controls, and that their presence was related to self-reported psychological distress in both groups (measured via a 10-point Likert scale of distress).

The finding that multiple emotional experiences occur during distress provides partial support for Linehan's (1993, 2007) theory of 'secondary emotions' for BPD. In this theory, multiple emotional experiences ('secondary emotions') are posited to occur in response to a failure to accept, and a desire to suppress, a primary emotion. The experience of secondary emotions is theorised to amplify and prolong experiences of distress and to increase the odds of engaging in a maladaptive behaviour, such as NSSI. Yet, to date, the relationship between multiple emotional experiences ('negative complex' and 'conflicting' emotions) and distress has not been substantiated by the assessment of distress-related behaviours, such as the occurrence of self-injurious thoughts (SIT) or NSSI. Also, the generalisability of the aforementioned research (Ebner-Priemer et al., 2008, 2007) is limited by the number of participants who were undergoing Dialectical Behaviour Therapy (DBT; 42%) at the time of the study. The emotion regulation skills training component of DBT potentially modified these participants' naturally occurring experiences of 'negative complex' and 'conflicting' emotions, along with the associated levels of distress.

The current study aims to address the limitations of prior research by investigating the relationship between multiple emotions, distress and NSSI early in the course of the disorder and prior to the effects of BPD specific psychotherapy, long-term polypharmacy, or entrenched functional problems that might modulate emotion regulation skills (Chanen, 2015). As the expression and understanding of negative complex and conflicting emotions develops prior to 10 years of age in normally developing children, multiple emotional experiences should be present early in the developmental course of BPD (Harter, 1983; Witre and Vallance, 1994).

## 1.2. Non-acceptance of emotions and its relationship with multiple emotions, distress and NSSI

The relationship between a failure to accept emotions, the experience of multiple secondary emotions, distress and engagement in NSSI

as posited in Linehan's (1993, 2007) theory of 'secondary emotions', is yet to be empirically investigated. Further, limited investigations of the relationship between non-acceptance of emotions and distress or NSSI in BPD have been conducted and the findings from these studies are mixed. For example, female outpatients with BPD who engaged in a 14-week group aimed at improving emotional acceptance (Gratz and Gunderson, 2006) experienced enhanced emotion regulation skills and reduced acts of self-harm, compared with treatment as usual (Gratz and Gunderson, 2006). Similarly, experiential avoidance, a related construct posited to enhance non-acceptance of emotions (Chapman et al., 2006), has been identified as the most common motive for engaging in NSSI in youth and adults with BPD (Andrewes et al., 2016; Brown et al., 2002; Hulbert and Thomas, 2010). In contrast, adults with BPD from an outpatient and community setting asked to accept their emotional experiences acknowledged a greater urge to engage in NSSI and self-punishment than participants asked to suppress them ( $n = 36$ ; Svaldi et al., 2012). Similarly, using an experiential sampling design, undergraduate students with elevated levels of BPD pathology who were asked to accept or observe their negative emotional experiences reported a greater number of urges to engage in impulsive behaviour and lower number of positive emotions, compared with days they were asked to suppress them. There were no significant differences, however, in the number of negative emotions experienced between days when asked to accept and suppress emotions (Chapman et al., 2009).

These conflicting findings indicate that further research is required to clarify the relationship between acceptance of emotions and distress. Furthermore, an investigation of the relationship between non-acceptance of difficult emotions and multiple emotional experiences during distress, and in the context of NSSI, remains a gap in the literature. Employing a youth sample of BPD with limited exposure to treatment also provides insight into these relationships early in the course of the disorder and prior to BPD specific psychological treatment which might alter emotion regulation skills.

## 1.3. The current study: aims and hypotheses

Limited and often conflicting findings from studies investigating the relationship between multiple emotions, non-acceptance of difficult emotions and distress constrains our understanding of the emotional experiences that contribute to engaging in NSSI. The current study aims to investigate the role of 'negative complex' and 'conflicting' emotions and non-acceptance of emotions in the context of engaging in self-harm and self-injurious thoughts, which substantiate the experience of distress in youth with BPD. In the absence of prior or conflicting empirical research, hypotheses were informed by Linehan's theory of 'secondary emotions' for BPD (1993; 2007). It was predicted that (i) an increase in the number of negative complex and conflicting emotions would occur prior to SIT and NSSI, with a reduction following SIT and NSSI that mirrors participants' changing levels of distress and fits a quadratic curve; (ii) for participants who did not engage in SIT or NSSI, changes in the number of negative complex and conflicting emotions and distress levels would not fit a quadratic curve; and (iii) lower acceptance of negative emotions would be associated with an increase in 'negative complex' and 'conflicting emotions' prior to SIT and NSSI.

## 2. Methods

### 2.1. Participants

One-hundred and thirteen acutely unwell, treatment-seeking patients with first-presentation BPD were recruited from two government-funded mental health services in western metropolitan Melbourne, Australia, as part of a larger randomised control trial (see Chanen et al., 2015). Six participants were excluded due to failure

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