EXAMINING THE RELATIONSHIP BETWEEN BORDERLINE PERSONALITY DISORDER TRAITS AND SUICIDE DESIRE THROUGH THE LENS OF THE THREE-STEP THEORY

by

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Abstract

The present study used the Three-Step Theory of Suicide (3ST) to explain the association between BPD traits and suicide desire. The 3ST states that pain and hopelessness cause suicide desire, and that the extent to which pain exceeds connectedness determines the intensity of suicide desire. The ability of these premises to explain elevated suicide desire in BPD was examined in 852 participants, including 456 with histories of suicide ideation or attempts. BPD traits, current suicide desire, pain, hopelessness, and connectedness were measured using validated self-report questionnaires. Consistent with step 1 of the 3ST, pain and hopelessness explained most of the association between BPD traits and suicide desire. Consistent with step 2, the association between BPD and intensity of suicide desire was fully accounted for by a pain-connectedness difference score. In a simpler model, pain, hopelessness, and connectedness reduced the correlation between BPD and suicide desire from $r=.41$ to $r_p=.08$. This research improves our understanding of why people with BPD traits experience suicide desire and informs the development of treatment and prevention strategies.
Lay Summary

According to the Three-Step Theory of Suicide (3ST), suicide desire develops when someone experiences unbearable pain combined with hopelessness that their pain will end, and it becomes stronger when they have more pain than meaningful connections that make life worth living. Although other factors like mental illness matter when considering suicide desire, they matter because they increase pain, hopelessness, or disconnection. Suicide desire is common in people with borderline personality disorder (BPD) traits. This study examined whether this could be explained by higher pain, hopelessness, and disconnection. Pain and hopelessness explained most of the link between BPD traits and suicide desire and having higher levels of pain than connection fully explained the link between BPD traits and higher suicide desire. This research is important because understanding why people with BPD traits experience suicide desire can improve treatments. Specifically, targeting experiences that cause pain, hopelessness, and disconnection may reduce suicide desire.
Preface

This thesis is original, unpublished, independent work by the author, Titania Dixon-Luinenburg. The leading concept formation and data analyses were done by the author with guidance from the thesis supervisor, Dr. David E. Klonsky. The writing of the thesis was done solely by the author. Data from this thesis were part of a larger project lead by Boaz Y. Saffer examining executive functioning and suicide. Dr. E. David Klonsky was also the supervisor on this larger project, and assisted with designing the study, interpreting data, and editing manuscripts. The project reported in this thesis was approved by the Behavioural Research Ethics Board of the University of British Columbia (approval certificate number: H14-01171) and was conducted in the Personality, Emotion, and Behaviour Laboratory (PEBL) at the University of British Columbia.
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Chapter 1: Introduction

Suicide is a leading cause of death world-wide (Centers for Disease Control and Prevention, 2014). In 2016, approximately 800,000 people died of suicide (World Health Organization, 2018), and each year 25 million people attempt to end their lives (Crosby et al., 2011). Cross-national estimates suggest that suicide ideation is even more common, with 2% of people reporting it annually (Borges et al., 2010) and 9% reporting ideation at some point in their life (Nock et al., 2008). Suicide ideation and attempts also seem to be increasing in some populations. For example, in undergraduate populations, suicide plans and attempts have doubled since 2012, and suicide ideation has increased 81% since 2007 (Duffy et al., 2019).

Despite an abundance of research on the issue, the field’s ability to prevent suicide does not appear to be meaningfully improving. Interventions and prevention strategies for suicide ideation and attempt are limited, and no interventions show substantially better outcomes compared to others (Fox et al., 2020). On average, treatments decrease suicide ideation a statistically significant but small amount, and do not seem to decrease the number of suicide attempts or deaths. Moreover, existing risk factors are weak predictors of future suicide ideation and attempts and thus have limited utility for risk assessments (Franklin et al., 2017; Huang et al., 2017).

Some suggest a different approach is needed to improve suicide prevention. For example, Fox et al (2020) advocate that research should aim to identify common, necessary causes of suicide, as opposed to unnecessary but sufficient conditions. Suicide ideation is a necessary feature that differentiates suicide death from accidental death (it is present before almost all suicide attempts), but it is often excluded from research and interventions related to suicide
(Jobes & Joiner, 2019). Thus, suicide ideation and the factors that cause suicide ideation are important targets for research and prevention.

**Ideation-to-Action Theories of Suicide**

Although past theories of suicide were important for guiding suicide research (e.g., Abramson et al., 2000; Baumeister 1990; Beck, 1967; Durkheim 1951/2005), they shared a common limitation: they did not differentiate suicide ideation from suicide attempts and deaths when providing explanations for suicide. Most people who develop suicide ideation do not go on to attempt suicide (Klonsky & May, 2014; Nock et al., 2008). Moreover, there are many strong predictors of ideation that do not strongly predict attempts among ideators (Klonsky & May, 2014). These discrepancies mean that offering a single explanation encompassing suicide ideation and attempts placed considerable limitations on our ability to understand their distinct mechanisms. A new generation of theories, coined “Ideation-to-Action” theories by Klonsky & May (2014), offer separate explanations for the development of suicide ideation and the progression from suicide ideation to suicide attempt.

Joiner’s Interpersonal Theory of Suicide (IPTS; Joiner, 2005) is viewed as the first ideation-to-action theory. According to the IPTS, perceptions of low belongingness (referred to as “thwarted belongingness”) and high burdensomeness (referred to as “perceived burdensomeness”) together lead to suicide desire\(^1\) (Joiner, 2005; Van Orden et al., 2008). Although there is some evidence to support this theory, there are also mixed findings regarding the role of these variables in suicide desire. For instance, in support of the theory, a recent meta-analysis found that the interaction of thwarted belongingness and perceived burdensomeness

\(^1\) Some recent theorists, including Joiner and Klonsky, use the term suicide desire rather than suicide ideation to put the focus on "desire for suicide".
predicted suicide desire more than either variable on its own (Chu et al., 2017). However, in an earlier systematic review one third of studies reported non-significant results when examining the interaction of perceived burdensomeness and thwarted belongingness in predicting suicide desire (Ma et al., 2016). The majority (82%) of studies found a significant main effect of perceived burdensomeness on suicide desire, whereas under half (40%) of studies found a significant main effect of thwarted belongingness on suicide desire.

Although there is mixed evidence for the specific elements of the IPTS, its framework represents a central contribution to suicidology (Klonsky & May, 2014). Importantly, this framework encouraged researchers to develop separate explanations for suicide desire and for suicide attempts. Since the IPTS was published, additional suicide theories have taken this ideation-to-action approach, offering specific explanations for the processes that lead to suicide desire and attempts (Klonsky et al., 2018). The most recent ideation-to-action theory is the Three-Step Theory of Suicide (3ST; Klonsky & May, 2015).

**The Three-Step Theory of Suicide**

The first step of the theory posits that the combination of pain (usually psychological) and hopelessness leads to suicide desire (Klonsky et al., 2018). People are largely shaped through behavioural conditioning: we avoid behaviours that are punished and engage in behaviours that are rewarded (Klonsky & May, 2015). When someone’s experience of engaging with life is characterized by pain, from a behavioural perspective they are being punished for living, and they will experience a powerful instinct to escape this pain. The 3ST purposefully does not specify the nature of the pain (Klonsky & May, 2015). Just as behaviour can be shaped through different forms of punishment, pain can arise from multiple sources. Mental illness, disruptions in relationships, chronic medical conditions, financial distress, difficult life
transitions, and many other factors can lead to psychological or physical pain (Pachkowski et al., 2021). Source aside, pain is a necessary condition for suicide desire.

When people experience pain, they seek out ways to stop or avoid the feeling. According to the 3ST, hopelessness determines whether suicide becomes a strategy to accomplish this (Klonsky & May, 2015). If people have hope that their pain can end, they will direct themselves towards ending the pain and having a better future. However, if they have no hope that their pain will subside, suicide becomes the only way to stop the pain. It is therefore the combination of pain and hopelessness that leads to suicide desire, and not just the experience of pain on its own.

The second step of the 3ST describes the conditions under which suicide desire intensifies. When experienced, suicide desire is most often reported to be moderate rather than strong or intense (Kleiman et al., 2017). Thus, it is important to specify the conditions under which suicide desire is strong. According to step 2 of the 3ST, suicide desire intensifies when pain exceeds or overwhelms feelings of connectedness (Klonsky & May, 2015). Connectedness is defined broadly and refers to peoples’ connections to others, valued roles (e.g., career), or any sense of meaning or purpose. When connectedness exceeds pain, it protects against strong suicide desire (Klonsky et al., 2018; Pachkowski et al., 2021) because one’s investment in living is worth the pain.

Importantly, in emphasizing pain, hopelessness, and connectedness, the 3ST does not dispute the role of risk factors for suicide desire (Klonsky & May, 2015). Undeniably, numerous disorders, personality traits, states of mind, and experiences are relevant to suicide desire. However, the 3ST offers explanations for why other risk factors matter; specifically, the 3ST states that any other variable impacts suicide desire to the extent that it impacts pain, hopelessness, and/or connectedness. For example, perceived burdensomeness may lead to
suicide desire, but only through its effects on pain, hopelessness, and/or connectedness. Moreover, perceived burdensomeness is not necessary for the development of suicide desire because other factors can impact pain, hopelessness, and connectedness in the absence of perceived burdensomeness.

**Empirical Support for the 3ST**

Because the impact of pain and hopelessness on suicide desire is thought to occur over short-time frames (similar to the impact of thirst on desire for water), the first two steps of the 3ST are best tested using cross-sectional, experimental, or micro-longitudinal research designs. Cross-sectional research designs can examine the concurrent association of pain and hopelessness to suicide desire, whereas experimental and micro-longitudinal research designs can examine the impact of pain and hopelessness on suicide desire over very short time-intervals (Klonsky & May, 2015). All studies to date that examine steps 1 and 2 of the 3ST have been cross-sectional. The first two steps of the 3ST have been supported in several populations, including a large online sample of people in the United States (Klonsky & May, 2015), undergraduate students in the UK (Dhingra et al., 2019) and China (Yang et al., 2018), a Canadian community sample (Pachkowski et al., 2021), and a Canadian sample of psychiatric inpatients (Tsai et al., 2021). Regarding step 1, in all five studies, pain and hopelessness interacted to predict suicide desire, and together accounted for substantial variability in suicide desire. To test step 2, a difference score was calculated by subtracting a standardized connectedness score from a standardized pain score to index the extent to which pain exceeds connectedness or vice versa. All five studies found that the pain-connectedness difference score was a robust predictor of stronger suicide desire among those at risk for suicide desire.
Other evidence also provides support for the importance of pain and hopelessness in suicide desire. For example, when compared to 40 other variables (e.g., social withdrawal, family conflict, anger/hostility, guilt/shame), pain and hopelessness were most often reported as occurring shortly before suicide attempts and deaths (Wintersteen, 2014). Moreover, among both adults and adolescents who have attempted suicide, pain and hopelessness were reported as the most common motivations for suicide attempts – more common than motivations such as burdensomeness, low belongingness, and help-seeking (May et al., 2020; May et al., 2016; May & Klonsky, 2013).

**Applications of the 3ST to Borderline Personality Traits**

One of the many potential applications of the 3ST is to help clarify why certain kinds of personality and clinical characteristics confer high risk for suicide. Borderline personality disorder (BPD) is one of the most strongly linked disorders to suicide in the literature (Oldham, 2006; Prada et al., 2018; Links et al., 2007). Eight to 10% of people with BPD die by suicide (Oldham, 2006) and approximately 75% attempt suicide (Goodman et al., 2017; Zanarini et al., 2008). BPD has a prevalence of 1.6 to 5.9% (American Psychiatric Association, 2013), yet 30% of those who die by suicide and 50% who attempt suicide are thought to have the disorder (Oldham, 2006). Rates of suicide are elevated in BPD in part because a large percentage of individuals with the diagnosis experience suicide ideation (Paris, 2002).

An important first step towards understanding why BPD confers risk for suicide is understanding why BPD personality traits are linked to suicide desire. Personality disorder traits exist on a continuum of general personality structure (Clark, 2007), meaning that BPD personality traits are present in clinical and non-clinical populations and measured on a continuum rather than categorically (Gardner et al., 2009).
Theoretically, the 3ST can explain why there is heightened suicide desire among people with BPD traits, and thereby inform suicide prevention and treatments for people with BPD traits. The 3ST suggests that any factor would increase risk for suicide desire to the extent that it increases pain, hopelessness, and/or disconnection. Thus, BPD traits may lead to suicide desire because they increase pain, hopelessness, and/or disconnection.

There are many theoretical and empirical reasons to believe that BPD traits impact these variables. It is plausible that BPD’s association with suicide desire could be accounted for by one, two, or all three of these factors, and this knowledge could help clinicians tailor interventions to target specific thoughts and feelings. For example, if the association between BPD traits and suicide desire is primarily accounted for by pain, then pain should be a primary treatment target for patients with BPD. Alternatively, if the association is explained by two or three of these factors, reduction of suicide risk may benefit from a more broad-based approach. Below, we explore existing knowledge about BPD’s potential impact on pain, hopelessness, and connectedness.

**Pain**

Conceptually, there are several BPD diagnostic criteria that could be considered painful. Specifically, chronic feelings of emptiness, affective instability, and inappropriate anger could each (or in combination) evoke or represent intense feelings of psychological pain (American Psychiatric Association, 2013). Some theoretical perspectives suggest that BPD patients transform intolerable feelings of rage, sorrow, shame, and/or terror into constant efforts to get others to notice the enormity of their emotional pain (Zanarini & Frankenburg, 1994). Moreover, the biosocial theory of BPD (Linehan, 1993) posits that years of repeated disorganized emotional responses result in trait-like emotion dysregulation, which leads to painful feelings such as
sadness, shame, and anger (Crowell et al., 2009). Dialectical behaviour therapy, which is based on the biosocial theory, views suicidal behaviour in BPD as a response to unbearable emotional suffering (Prada et al., 2018).

There is also evidence to suggest that pain is high among people with BPD and BPD traits. For instance, several studies have reported a significant relationship between BPD features and negative affect. Tolpin et al (2004) used ambulatory monitoring over a two-week period and found that participants with higher BPD features experienced more daily negative affect than participants with lower BPD features. In addition, Zeigler-Hill and Abramson (2006) found higher levels of unstable high negative affect among undergraduate students with higher BPD features compared to lower BPD features. The significant association between negative affect and BPD features is also supported among those with a diagnosis of BPD. Nica and Links (2009) reviewed experience sampling studies and found that people with BPD experienced intense negativity and abrupt changes in mood when compared to healthy controls and individuals with depression. Moreover, clinician reports indicate that BPD patients experience higher emotional distress compared to patients with chronic depression (Zittel Conklin & Westen, 2005).

In addition to psychological forms of pain, BPD is associated with high levels of chronic physical pain (Sansone & Sansone, 2012). There is a disproportionate number (30% on average across studies) of people with BPD among chronic pain patients, and as many as 65% of patients with BPD have a chronic pain diagnosis at some point in their life (Johnson et al., 2020). Furthermore, research suggests that the presence of BPD intensifies feelings of physical pain (Sansone & Sansone, 2012). Taken together, theory and research suggest that many forms of pain are substantially elevated in BPD.
Hopelessness

Hopelessness may also be elevated among people with BPD. According to the biosocial theory of BPD, emotion dysregulation over time becomes trait-like, leading to feelings of hopelessness (Crowell et al., 2009). Although none of the BPD symptoms directly reference hopelessness, the chronicity of symptoms and patterns causing pain may eventually cause hopelessness. When maladaptive cycles common in BPD continue over time (e.g., persistent unstable relationships, self-injury, impulsivity), it may be increasingly difficult to believe that healthier coping and increased stability is achievable. DBT therefore targets feelings of hopelessness by teaching skills like cheerleading statements, which aim to generate hope that change is possible (Miller et al., 2017).

There is also evidence to suggest that hopelessness is high among people with BPD. Rogers et al (1995) found a moderate correlation between BPD (measured through two different diagnostic interviews) and hopelessness. Moreover, Fertuck et al. (2016) found that people with BPD reported higher levels of hopelessness than people with depressive disorders and healthy controls.

Connectedness

There are several reasons to believe that connectedness is disrupted among people with BPD. Two diagnostic criteria directly impact connectedness, including unstable and intense interpersonal relationships and efforts to avoid real or imagined abandonment (American Psychiatric Association, 2013). People with BPD are thought to alternate between viewing their loved ones in overly positive and overly negative ways (American Psychiatric Association, 2013), which may create problems and instability in close relationships. These intense fluctuations combined with symptoms such as abandonment concerns, inappropriate reactions to
interpersonal difficulties, and anger outbursts may make it difficult for people with BPD to sustain healthy relationships long-term. The general instability that often accompanies BPD symptoms may also impact other opportunities for connection. For example, it may be difficult to find a sense of meaning through work-related activities if someone experiences repeated interpersonal difficulties at work or changes careers frequently (Marco et al., 2015).

There is a wealth of empirical evidence to suggest that people with BPD experience difficulties with connectedness. In a network analysis, loneliness emerged as one of the central features of BPD (Southward & Cheavens, 2018). BPD has one of the strongest relationships with loneliness of all the personality disorders (Hengartner et al., 2014) and when compared to neurotic disorders (Richman & Sokolove, 1992). In an experience-sampling study, despite their feelings of loneliness people with BPD showed ambivalent reactions to social proximity (i.e., closeness) when compared to people with avoidant personality disorder and healthy controls (Gadassi et al., 2014). Although social proximity decreased feelings of rejection and isolation in people with BPD, it also increased feelings of anger and shame. People with BPD also appear to experience social disconnection more easily than controls. De Panfilis et al (2015) found that compared to controls, patients with BPD experienced less social connection when excluded from a virtual ball-tossing game and when included as much as other players (though not when included more than other players; De Panfilis et al., 2015). Lastly, in addition to difficulties loneliness and social connection, Marco et al., (2017) found a strong, negative correlation between meaning in life (the sense that one’s life is important and matters) and the main symptoms of BPD (Marco et al., 2015).
The Current Study

Although the literature reviewed suggests that pain, hopelessness, and connectedness may account for the relationship between BPD traits and suicide desire, this possibility has not been studied. It is possible that these factors explain equal amounts of variance in the relationship between BPD traits and suicide desire, or that some factors are more important than others. Alternatively, it is possible that, in contrast to 3ST premises, these factors do not account for the relationship between BPD traits and suicide desire.

The current study explored these possibilities in a cross-sectional sample of undergraduate students at a large university in the Pacific Northwest. After validating the 3ST in our sample and confirming an association between BPD traits and suicide desire, we conducted theory-specific analyses to determine if the relationship of BPD traits to suicide desire worked in the manner specified by the 3ST. First, we examined whether the interaction between pain and hopelessness accounted for more variance in the relationship between BPD traits and suicide desire over and above pain and hopelessness. Second, we examined whether the extent to which pain exceeded connectedness accounted for the association between BPD traits and increased suicide desire among participants with current suicide desire. Together, we expected the premises of step 1 (pain and hopelessness) and step 2 (the extent to which pain exceeds connectedness) to account for the entire association between BPD and suicide desire. For descriptive and exploratory purposes, we also examined pain, hopelessness, and connectedness as covariates in the relationship between BPD traits and suicide desire to see how much they accounted for together and on their own. We expected that each variable on its own would account for a substantial amount of the relationship, and that together they would account for most of the relationship.
Chapter 2: Methods

Participants

The data from this study are part of a larger study exploring the relationship between executive function and suicide desire in undergraduate students (Saffer, 2021). 1,154 participants oversampled for suicide ideation and attempts were recruited between January 2016 and April 2019 through the Department of Psychology’s Human Subject Pool (HSP), which is an online platform at the University of British Columbia that allows students to participate in psychological research in exchange for course credit and/or financial compensation. In this original study, 2 screening questions from the Youth Risk Behaviour Survey (which inquire about lifetime suicide ideation and attempts; YRBS; Grunbaum et al., 2002; Kolbe et al., 1993; see Measures) were used to oversample for participants with histories of lifetime suicide ideation and attempts.

To examine how different covariates impact the association between BPD and suicide desire, we limited analyses to participants who had complete data on BPD traits, suicide desire, and all covariates. This reduced the sample size by 287 participants. Two additional participants were excluded because they reported a lifetime history of suicide attempt(s) but not suicide ideation, which seems to indicate invalid responses. To ensure that participants’ responses were accurate, the study had 13 attention-checking questions embedded within the questionnaires (e.g., “I have won more than two Nobel prizes”). 13 participants responded to two or more attention-checking questions incorrectly ($M=2.77$, $SD=1.69$, range = 2-8) and were therefore removed from the analyses. A total of 852 participants were included in the analyses.

Of the 852 participants, 139 participants reported at least one suicide attempt in their lifetime (25 participants reported at least one suicide attempt in the past 12 months), 317
participants reported suicide ideation without a suicide attempt in their lifetime (106 reported suicide ideation without a suicide attempt in the past 12 months), and 396 participants reported no suicide ideation or attempts in their lifetime (721 reported no suicide ideation or attempts in the past 12 months). In terms of gender, 663 (77.8%) identified as female, 180 (21.1%) identified as male, and 9 (1.1%) identified as non-binary. In terms of ethnicity, 411 (48.2%) identified as East Asian descent, 228 (26.8%) identified as European descent, 85 (10%) identified as Indian-South Asian descent, 31 (3.6%) identified as Middle Eastern descent, 18 (2.1%) identified as Latin American-Hispanic descent, 8 (.9%) identified as African descent, 2 (.2%) identified as Native American descent, and 69 (8.1%) identified as an ethnicity other than those listed. Participants’ age ranged from 18-45 years old ($M=20.94$, $SD=3.01$).

**Procedure**

Participants who completed the HSP screening questionnaire were offered the opportunity to participate in the present study. Regardless of their responses to the screening questions, participants were all presented with the same description of the research study, which described the study as examining the relationship between personality, emotion, and attention. Participants were told that the study would take two hours to complete and would consist of computerized tasks and self-report questionnaires. They were reimbursed 2 HSP credits for their time, which is consistent with HSP guidelines (1 hour of participation = 1 credit). For the purpose of the current study we will focus only on the relevant self-report measures.

Participants who registered for the study came to the lab for their timeslot and met with a Research Assistant (RA) who greeted them, confirmed their participation, and obtained their written consent. The RA informed participants that they could withdraw from the study at any time and would not have their credits revoked for doing so. Before beginning the study
questionnaires, participants were asked to list their top 5 strengths and values as well as the positive coping strategies they use to manage stress. The RA then administered the questionnaires through Qualtrics, which is a large online survey platform provided through UBC. Participants first completed a demographics questionnaire, which was followed by a series of clinical questionnaires. Standardized and validated measures of BPD, pain, hopelessness, connectedness, and suicide ideation in the past 12 months were administered by the RA. Moreover, current suicide desire was measured in participants who endorsed a lifetime history of suicide ideation.

At the end of the study, participants were reminded of their strengths, values, and coping resources to lessen possible distress due to the study measures. Participants were also given a comprehensive list of online and community mental health resources. To debrief, the RA told participants about the purpose of the study. Ethical approval for this study was granted by the Behavioural Research Ethics Board at UBC (Study BREB Number: H14-01171).

**Study Measures**

**Suicide Ideation and Suicide Attempts**

Participants’ lifetime and recent history of suicide ideation and suicide attempts was assessed using four questions taken from the Youth Risk Behaviour Survey (YRBS; Grunbaum et al., 2002; Kolbe et al., 1993). This is a broad survey administered semi-annually to adolescents in grades 9-12 in the United States by the Centre for Disease Control (CDC), and it assesses various health risk behaviours. To assess lifetime history of suicide ideation and suicide attempts, participants responded to the following items in the screening questionnaire with either “Yes or “No”: “Have you ever seriously thought about killing yourself” (item 1, measuring suicide ideation) and “Have you ever tried to kill yourself” (item 3, measuring suicide attempts).
To assess recent history of suicide ideation and suicide attempts, participants responded to the following items during the laboratory visit: “During the past 12-months, did you ever seriously consider attempting suicide?” (item 7) and “During the past 12-months, how many times did you actually attempt suicide?” (item 9). Participants selected either “Yes” or No” for the recent suicide ideation question and used a scale ranging from 1 (0 times) to 5 (6 or more times) to indicate the number of recent suicide attempts for the recent suicide attempt question.

The YRBS items targeting lifetime and recent suicide ideation and suicide attempts are most highly and significantly correlated with other items measuring suicidality, such as the Patient Health Questionnaire for Adolescents (PHQ-A; Kroenke & Spitzer, 2002), r-range = .35-.71 (May & Klonsky, 2011). These items are also significantly correlated with psychological constructs that are known to confer risk for suicide, such as the MSI-BPD (Zanarini et al., 2003), r-range = .31-.51 (May & Klonsky, 2011).

**Demographics Questionnaire**

Demographic information was collected using a questionnaire developed in the Personality, Emotion, and Behaviour Laboratory (PEBLab). The questionnaire is made up of 12 items, and it includes questions about participants’ age, gender, ethnicity, first language, sexual orientation, marital status, highest education, occupation, household income, weekly working hours, and the number of people residing in the participant’s household.

**Borderline Personality Disorder Traits**

Participants’ BPD traits were assessed using the 10-item McLean Screening Instrument for Borderline Personality Disorder (MSI-BPD; Zanarini et al., 2003). The MSI-BPD was derived from items in the BPD section of The Diagnostic Interview for DSM-IV Personality Disorders (DIPD-IV; Zanarini et al., 1996), and it assesses difficulties characteristic of BPD.
(e.g., “Have you made desperate efforts to avoid feeling abandoned or being abandoned? [e.g., repeatedly called someone to reassure yourself that he or she still cared, begged them not to leave you, clung to them physically]” [Item 10]). Item 2 targets self-harm, and we omitted it from our analyses to avoid inflating the relationship between BPD traits and suicide desire, and thus only used the remaining 9-items to assess BPD traits. Participants responded to each item by selecting either “Yes” or “No”, and endorsed items were given a score of 1, whereas non-endorsed items were given a score of 0. A total score was calculated by summing the items, with scores ranging from 0 to 9 (with item 2 removed) and higher scores suggesting greater symptoms of BPD. Although the full scale has a cut-off score of 7 for identifying individuals diagnosed with BPD (Melartin et al., 2009; Zanarini et al., 2003), we used the 9 items of the MSI-BPD to assess BPD traits as a continuous score to reflect the continuous nature of BPD.

Several studies have examined the psychometric properties of the MSI-BPD. In clinical and non-clinical samples, internal consistency reliability ranged from $\alpha=.74-.86$ (Gardner & Qualter, 2009; Glenn & Klonsky, 2011; Zanarini et al., 2003), and test-retest reliability was reported as $r=.72$ (Zanarini et al., 2003). Moreover, studies exploring the factor structure of the MSI-BPD found that the variance in scores was best explained by a single factor (first eigenvalue=4.54 second eigenvalue=1.00; Gardner & Qualter, 2009). When compared with the items on the DIPD-IV, the individual items on the MSI-BPD correlated between $\phi=.30-.59$ (median correlation $\phi=0.48$; Zanarini et al., 2003). Furthermore, the total MSI-BPD correlated very highly with other measures of BPD, such as the Personality Diagnostic Questionnaire-4 (PDQ4; Hyler, 1994; $r=.84$) and the Borderline Features Scale of the Personality Assessment Inventory (PAI-BOR; Morey, 1991; $r=.85$).
In this study, the internal consistency reliability of the 9 items included from the MSI-BPD was $\alpha=.78$.

**Hopelessness**

Participants’ hopelessness was measured using the Beck Hopelessness Scale-Short Form (BHS-SF; Aish et al., 2001), which is a shortened version of the Beck Hopelessness Scale (BHS; Beck et al., 1974) made up of 4 items. The BHS-SF measures participants perceived levels of hopelessness during the past week through asking them to rate each item as either “True” or “False”, and these responses were scored as 1 and 0 respectively. Items 1 and 4 were reverse coded as they are reverse-worded, and then the total score was calculated by summing all four items. Scores range from 0 to 4 with greater scores indicating higher levels of hopelessness.

The BHS-F was derived from factor analysis of the full 20-item BHS (Aish et al., 2001), and the two scales appear to be strongly correlated ($r=.88$; Yip & Cheung, 2006). Moreover, BHS-SF scores seem to closely resemble those obtained using the 20-item BHS in predicting suicide ideation (BHS-SF Area Under the Curve [AUC]=.70 and BHS AUC=.77) and suicide attempts (BHS-SF AUC=.72 and BHS AUC=.75).

In this study, the internal consistency reliability of the BHS-SF was $\alpha=.76$.

**Connectedness**

Participants’ sense of connectedness was measured using a reverse-coded version of the 5-item thwarted belongingness subscale in the 10-item Interpersonal Needs Questionnaire (INQ-10; Bryan, 2011; Hill et al., 2015; Van Orden et al., 2008). The thwarted belongingness subscale measures the extent to which individuals feel disconnected from others, and participants responded to each item using a 7-point Likert scale ranging from 1 (*Not at all true for me*) to 7 (*Very true for me*). To obtain a total score, items 8 and 9 were reverse coded and all the subscale
item responses were summed to create a score ranging from 5 to 35. Reverse-coded versions of both the INQ-10 thwarted belongingness subscale (e.g., Klonsky & May, 2015) and the INQ-15 (Tsai et al., 2021) have been used to measure connectedness in the 3ST.

The INQ-10’s two-factor structure has been replicated in four samples, and the internal consistency reliability of the thwarted belongingness factor was between $\alpha=.80-.86$ (Bryan, 2011; Hill et al., 2015; Van Orden et al., 2008). In this study, the internal consistency reliability of the reverse coded version of the thwarted belongingness subscale was $\alpha=.88$.

**Pain**

Participants’ psychological pain was assessed using the Unbearable Psychache Scale (UP3; Pachkowski et al., 2019), which is a shortened 3-item measure derived from the 13-item Scale of Psychache (Holden et al., 2001). The UP3 uses item 10 (“I can’t take the pain anymore”), 11 (“Because of my pain, my situation is impossible”), and 12 (“My pain is making me fall apart”) from the Scale of Psychache to measure facets of unbearable psychological pain (Pachkowski et al., 2019). Each item was rated using a 5-point Likert scale ranging from 1 (“Strongly disagree”) to 5 (“Strongly agree”), and a total score between 0 and 15 was calculated by summing the answer to each of these items, with higher scores indicating greater Psychache.

The UP3 is reported to have high internal consistency reliability ($\alpha=.93$) in a large sample of online participants ($n>1,000$) and a sample of psychiatric inpatients (Pachkowski et al., 2019). Moreover, the same study found that the UP3 was highly correlated with scores on the 13-item Scale of Psychache ($r=.90$). It was also correlated with measures assessing suicide ideation (BSS-5; $r=.73$), hopelessness (BHS-SF; $r=.75$), perceived burdensomeness (INQ-10; $r=.73$), and thwarted belongingness (INQ-10; $r=.69$).

In this study, the internal consistency reliability of the UP3 was $\alpha=.92$. 
Suicide Desire

Participants’ current suicide desire was assessed using the first five items of the Beck Scale for Suicidal Ideation (BSS-5; Beck et al., 1988). Factor analytic studies suggest that suicide desire (desire for suicide) is distinct from other kinds of suicide ideation (courage to attempt suicide, plans/preparations for suicide; Beck et al., 1979, 1997; Dhingra et al., 2019). The first two steps of 3ST theory concern suicide desire, whereas aspects of suicide ideation such as courage to attempt and plans/preparations are more relevant to Step 3 of the theory, which addresses when suicide desire is acted upon. Therefore, the present study used the first 5 items to assess suicide desire, as factor analytic studies consistently find these items to assess suicide desire specifically (Beck et al., 1979, 1997; Dhingra et al., 2019).

The BSS-5 items assess participant’s wish to live, wish to die, relative strength of reasons for living versus dying, desire to attempt suicide, and passive suicide desire (i.e., the extent to which someone would actively prevent death by suicide). Specifically, participants were asked to select the statement that most accurately describes how they’ve been feeling. For instance, item 1 presents three statements: (0) “I have no desire to kill myself”, (1) “I have a weak desire to kill myself” or (2) “I have a moderate to strong desire to kill myself”. Total scores on the BSS-5 range from 0 to 10, and they were calculated by summing the items. Only participants who reported experiencing suicide ideation in the HSP screening questionnaire completed the BSS-5, and participants who reported no lifetime history of suicide ideation on the first item of the YRBS were assigned a score of 0 and were not administered the BSS-5.

Studies using the BSS-5 (Shahnaz et al., 2018) have found high internal reliability consistency (α=.86). In this study, the internal consistency reliability of the BSS-5 was α=.85.
when including participants who were assigned a score of 0, and $\alpha=.68$ when including only those who reported suicide desire.
Chapter 3: Results

Data Analytic Plan

Before testing our hypotheses, we used linear regression and Pearson correlation to validate the first two steps of the 3ST in our sample. We then used linear regressions and partial correlations to test our hypotheses.\(^2\) First, we examined if the relationship of BPD traits to suicide desire worked in the manner specified by the 3ST. Consistent with step 1 of the theory, we used linear regressions to explore the extent to which the association of BPD traits to suicide desire was explained by the interaction between pain and hopelessness. Consistent with step 2 of the theory, we focused analyses on the subset of participants who reported suicide desire; specifically, we used partial correlation to examine whether the association of BPD traits to the intensity of suicide desire was accounted for by a variable indexing the difference between participants’ pain and connectedness. We calculated the difference score by standardizing the scores for pain and connectedness, and then subtracting the standardized connectedness score from the standardized pain score.

We then conducted four partial correlations for exploratory and descriptive purposes. Specifically, three partial correlations examined the extent to which pain, hopelessness, and connectedness each accounted for the association between BPD traits and suicide desire. A fourth partial correlation simultaneously included pain, hopelessness, and connectedness as covariates to determine the extent to which they together accounted for the relationship between BPD traits and suicide desire.

\(^2\) Although mediation analyses may seem appropriate for testing the indirect effects of the 3ST variables on suicide desire, recent consensus suggests that mediation cannot be used appropriately in a cross-sectional dataset (Maxwell & Cole, 2007; Maxwell et al., 2011).
We used the software G*Power 3 (Faul et al., 2009) to obtain an estimate of the sample size necessary to obtain significant effects. All analyses except one used regression/correlation analyses with the full sample of participants. The most complex analysis involved regression with 4 predictor variables and was therefore the basis for the power analysis. For a regression equation with 4 predictors, alpha of .05 (two-tailed), and \( n = 852 \), power to detect a small effect size (\( f^2 = .10 \)) exceeds .99. The remaining analysis involved participants with current suicide desire only (\( n = 267 \)). For a regression equation with 4 predictors, alpha of .05 (two-tailed), and \( n = 267 \), power to detect a small effect size (\( f^2 = .10 \)) exceeds .99.

**Results**

See Table 1 for descriptive statistics for pain, hopelessness, connectedness, suicide desire, and BPD traits. These variables exhibited moderate to large correlations with each other (See Table 2). See Table 3 for descriptive statistics of only participants who reported suicide desire.

Before conducting analyses to test our hypotheses, we tested to see whether the assumptions of normality were met. All variables had skewness and kurtosis within acceptable limits except for suicide desire in the full sample (skewness = 2.27, kurtosis = 4.79). We ran analyses using both the original version and the square root transformed version of suicide desire, which reduced skewness and kurtosis to within acceptable limits. Results for the transformed variable were equivalent and are available upon request. All analyses reported used the original scores for suicide desire.

**Validating the 3ST**

Before examining whether 3ST premises could account for the association between BPD traits and suicide desire, we examined whether the 3ST premises performed as expected in our
sample. First, we examined the direct effects of pain and hopelessness on suicide desire. As expected, both pain ($r=.54, p<.001$) and hopelessness ($r=.54, p<.001$) exhibited robust correlations with suicide desire. As a direct test of step 1 of the 3ST, we examined whether pain and hopelessness interacted to predict suicide desire. The interaction term was significant ($t=6.30, p<.001$), and the full model explained 43% of the variance in suicide desire. The interaction term explained an additional 3% of the variance over and above the main effects. We probed the nature of the interaction using the pick-a-point approach (see Figure 1; Aiken et al., 1991). This involved selecting values for pain and hopelessness that were 1 standard deviation above and below the mean to compute the predicted values and graph the interaction. At low levels pain, hopelessness exhibited a minimal relationship to suicide desire, whereas at high levels pain, hopelessness exhibited a positive linear relationship to suicide desire. The interaction is consistent with the 3ST that suggests that high levels of pain and hopelessness lead to suicide desire.

Second, we tested the step 2 hypothesis that, among those with current suicide desire, desire is stronger when pain exceeds connectedness (i.e., when one’s pain exceeds one’s connection to someone/something in life). To do this, we standardized scores for pain and connectedness, and then subtracted connectedness scores from pain scores. Thus, positive scores indicated that pain exceeds connectedness, whereas negative scores indicated that connectedness exceeds pain. If our hypothesis is correct, this difference score should be a powerful predictor of suicide desire intensity among those with non-zero ideation. As predicted, the correlation between the pain-connectedness difference score and the intensity of suicide desire was strong ($r=.58, p<.001$).
**Using the 3ST to Account for the Relationship Between BPD traits and Suicide Desire**

To test our main hypotheses, we examined whether the relationship between BPD traits and suicide desire works in the manner stated by the 3ST. We used three linear regressions to explore the extent to which the association of BPD traits to suicide desire was accounted for by pain, hopelessness, and their interaction. The first linear regression estimated the direct association between BPD traits and suicide desire without controlling for any covariates. Variance explained was found to be 16% \((p<.001)\). The second linear regression examined the extent to which the relationship between BPD traits and suicide desire is reduced when accounting for pain and hopelessness. Pain, hopelessness, and BPD traits together accounted for 41% of the variance in suicide desire \((p<.001)\). As predicted, variance in suicide desire explained by BPD traits was reduced to 2% \((p<.001)\) after controlling for pain and hopelessness. The third linear regression examined the extent to which the relationship between BPD traits and suicide desire is reduced when accounting for the interaction between pain and hopelessness. The interaction term and BPD traits together accounted for 44% of the variance in suicide desire \((p<.001)\). Contrary to predictions, variance in suicide desire uniquely explained by BPD traits remained at 2% \((p<.001)\) and thus was not further reduced after controlling for the interaction between pain and hopelessness. Though the interaction term did not further reduce the relationship between BPD traits and suicide desire, it is hard to interpret this finding as the variance explained in suicide desire by BPD traits had already been reduced from a substantial 16% to a minimal/negligible 2%.

We then examined whether step 2 of the 3ST could account for the relationship of BPD traits to intensity of suicide desire in those with suicide desire. Specifically, we used Pearson correlation and point biserial correlation to examine the extent to which the pain-connectedness
difference score reduced the relationship between BPD traits and the intensity of suicide desire among people reporting suicide desire ($n=267$). BPD traits and suicide desire intensity were moderately correlated ($r=.25, p<.001$). Consistent with the 3ST, after controlling for the pain-connectedness difference score, the correlation between BPD traits and intensity of suicide desire was reduced to $r=.05$ ($p=.43$).

For descriptive and exploratory purposes, we also examined pain, hopelessness, and connectedness separately and together as covariates that might account for the relationship between BPD traits and suicide desire. First, we used Pearson correlation to examine the relationship between BPD traits and suicide desire, and found a moderate correlation ($r=.41, p<.001$). Second, we conducted point biserial correlations examining pain, hopelessness, and connectedness as respective covariates of this relationship. There was a small association between BPD traits and suicide desire when pain ($r=.18, p<.001$), hopelessness ($r=.26, p<.001$) and connectedness ($r=.22, p<.001$) were added as separate covariates. Third, we examined pain, hopelessness, and connectedness together as covariates of the relationship between BPD traits and suicide desire. A minimal correlation remained between BPD traits and suicide desire after accounting for pain, hopelessness, and connectedness ($r=.08, p=.022$).
Chapter 4: Discussion

This study examined whether the Three-Step Theory of suicide (3ST) can explain why suicide desire is elevated among people with BPD traits. To answer this question, we analyzed whether pain, hopelessness, and disconnection (the three variables emphasized in the 3ST) can account for the association between BPD traits and suicide desire in a large group of undergraduates over-sampled for histories of suicide ideation and attempts.

Overall, the findings suggest that the 3ST provides valuable insight as to why suicide desire is prevalent among people with BPD traits. Specifically, the relationship of BPD traits to suicide desire appeared to work in the manner stated by the 3ST. Consistent with step 1 of the 3ST, pain and hopelessness accounted for most of the association between BPD traits and suicide desire. Consistent with step 2 of the 3ST, a variable indexing the extent to which pain exceeds connectedness accounted for all the remaining association between BPD traits and the severity of suicide desire.

We also found that pain, hopelessness, and connectedness were all important in explaining suicide desire among people with BPD traits. When examined individually as covariates, each accounted for part but not all the relationship and their impacts on the association between suicide desire and BPD traits were comparable. Together, all three variables accounted for the vast majority of the association between BPD traits and suicide desire.

Implications

This study can be viewed as providing a novel way to test the validity of the 3ST. Like other studies, we directly examined the premises of the 3ST. Unlike other studies, this study examined whether 3ST premises can account for elevated suicide desire associated with a particular diagnosis. According to the 3ST, any variable – whether an experience, trait, or
diagnosis – will be associated with suicide desire to the extent it is associated with pain, hopelessness, and/or disconnection. To test this notion, we examined whether the variables emphasized in the 3ST could explain the association between BPD traits and suicide desire. Overall, the 3ST premises performed very well in explaining this association, a pattern that further supports the validity of the 3ST.

Our findings suggest the 3ST can help organize the large literature on suicide risk in BPD. For example, this literature has identified numerous variables related to suicide risk in BPD, such as affective instability (Glenn et al., 2013; Links et al., 2007), negative mood intensity (Links et al., 2007), emotion dysregulation, and interpersonal stressors (Kaurin et al., 2020). The 3ST suggests that the impacts of these and many other potential risk factors on suicide desire can be understood through their impacts on pain, hopelessness, and/or connectedness.

This study also has implications for the stigma surrounding suicidality in BPD. Indeed, suicide desire in BPD patients is sometimes seen by healthcare providers as manipulative and purposeful (Fraser & Gallop, 1993; Kyratsous & Sanati, 2017; Woollaston & Hixenbaugh, 2008). However, the results suggest that suicide desire is best understood as a natural consequence of the pain, hopelessness, and disconnection caused by BPD symptoms. In other words, suicide desire does not appear to be different in BPD than other populations and can be understood in the same way as other populations (because of pain, hopelessness, and disconnection).

The results can improve our understanding of current suicide risk in people with BPD traits. Specifically, if suicide desire is high when pain, hopelessness, and disconnection are high, these experiences can be seen as warning signs that signal higher suicide risk. Future research
should explore whether inquiring about current feelings of pain, hopelessness, and connectedness improves how we assess current suicide risk among people with BPD or BPD traits.

Understanding why people with BPD traits experience suicide desire can inform future intervention studies. Though we could have found that suicide desire in BPD was mainly driven by pain, hopelessness, or disconnection, this study suggests that all three variables contribute comparably to suicide desire and should therefore all be addressed in treatment. If clinicians can identify what experiences are causing pain, hopelessness, or a loss of connection in their clients’ lives, they can target these experiences in treatment to decrease suicide desire. Treatments like DBT already emphasize skills for emotion regulation and interpersonal effectiveness that are relevant for addressing pain, hopelessness, and disconnection (McKay et al., 2019). However, it may be useful to tailor these techniques to directly address these experiences as key treatment targets. Future research examining the efficacy of targeting the sources of pain, hopelessness, and disconnection in treatment is important and further implicated by our findings.

**Strengths, Limitations, and Future Directions**

Strengths of this study include the use of validated measures for key constructs, measurement of BPD traits as a dimensional rather than categorical variable, and a large sample size. All measures had adequate to excellent internal consistency in our sample, and our use of a continuous measure (the MSI-BPD) to assess BPD traits gave rich information about the association between different levels of BPD traits and suicide desire. Moreover, the large sample increases confidence that the results accurately reflect the role of pain, hopelessness, and connectedness in suicide desire among people with BPD traits.

There are several limitations of the study. First, there was an over-representation of people of East Asian and European descent in our sample and almost all participants self-
identified as cis-gendered. There were very few participants who self-identified as Latin American-Hispanic descent, African descent, Native American descent, or non-binary. In addition, our undergraduate sample consisted of students who were younger and had higher socioeconomic status than the general population. People of lower socioeconomic status and/or groups who face unique obstacles, prejudice and discrimination may have different experiences than the sample in this study. Thus, replicating the study in diverse samples is important for determining whether the results generalize to other populations. This study should be replicated in a community sample that includes people from specific minority backgrounds (e.g., racial, sexual, and gender minorities) to see if the same findings emerge.

Second, even though the participants were oversampled for suicidality, they were not oversampled for BPD traits and did not have clinical diagnoses of BPD. The recommended cut-off score to screen for a diagnosis of BPD using the MSI-BPD is 7 out of 10 (Zanarini et al., 2003), and 17% met or exceeded this cut-off. Thus, our sample primarily consisted of people with milder levels of BPD and does not adequately represent the full spectrum of BPD symptoms, including participants from clinical and hospital samples. Future research should examine the role of pain, hopelessness, and connectedness in participants with full variation in BPD traits. This work would also benefit from use of validated structured or semi-structured interview measure of BPD.

Third, this study did not examine how individual BPD symptoms relate to pain, hopelessness, connectedness, and in turn, suicide desire. These kinds of analyses would have been impractical as the MSI-BPD has only 1 true-false item for most diagnostic criteria. Future work with comprehensive measures would be useful for understanding whether certain BPD
symptoms have particularly large associations with pain, hopelessness, disconnection, and thus suicide desire.

Fourth, the current study examined whether the first two steps of the 3ST can account for the relationship between BPD traits and suicide desire. However, we did not explore whether suicide attempts can be explained by step 3 of the 3ST, which describes the transition from suicide desire to a suicide attempt through three forms of suicide capability (Klonsky & May, 2015). Although it is important to understand why suicide desire develops and intensifies, understanding who is at higher risk of attempting suicide is critical for optimizing prevention and intervention strategies for this population. Future research should examine whether the 3ST can explain suicide desire and attempts among people with BPD traits.

Fifth, we did not include a measure of physical pain. The 3ST suggests that any form of pain, be it physical or psychological, is relevant for the development of suicide desire. Our study examined psychological pain only and thus did not fully encompass the pain construct described in the 3ST. Future research should examine whether both physical and psychological pain account for suicide desire among people with BPD traits.

Sixth, the results of this study are based entirely on self-report measures. Behavioural, qualitative, or interview data could increase the validity of our results and provide unique information about the role of pain, hopelessness, and connectedness in suicide desire among people with BPD traits. For example, future research could use “gold-standard” structured diagnostic interviews in addition to self-report measures.

Eighth, all self-report measures used included fewer than 10 items. This study was part of larger project in the lab involving a long questionnaire battery and cognitive task, and participant fatigue was a consideration to ensure accurate responding. Thus, shorter measures were
prioritized. Nonetheless, longer measures can be more reliable and valid than measures with fewer items.

Lastly, this study was cross-sectional in nature and cannot provide causal information about the impact of pain, hopelessness, and connectedness on suicide desire in people with BPD traits. To confirm causality, future research using an experimental research design is needed. For instance, an experimental study could determine whether increasing participants’ connectedness decreases the intensity of their suicide desire, which would provide further support for step 2 of the 3ST. Alternatively, micro-longitudinal studies could reveal that within people, pain, hopelessness, and suicide desire ebb and flow in tight synch with one another, and decreased connectedness is often accompanied by increased suicide desire intensity. These kinds of findings in combination with the findings presented could help provide a fuller picture of what causes suicide desire among people with BPD traits and other populations.
**Tables**

**Table 1. Descriptive statistics**

<table>
<thead>
<tr>
<th>Variable</th>
<th>( M )</th>
<th>( SD )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain (Scale of Psychache)</td>
<td>5.80</td>
<td>2.90</td>
</tr>
<tr>
<td>Hopelessness (BHS)</td>
<td>.81</td>
<td>1.22</td>
</tr>
<tr>
<td>Connectedness</td>
<td>24.10</td>
<td>7.15</td>
</tr>
<tr>
<td>Suicide Desire (BSS-5)</td>
<td>.88</td>
<td>1.70</td>
</tr>
<tr>
<td>BPD traits (MSI-BPD)</td>
<td>3.05</td>
<td>2.52</td>
</tr>
</tbody>
</table>

*Note: \( n=852 \)*
### Table 2. Correlations between measures

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<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pain (Scale of Psychache)</td>
<td>.47**</td>
<td>-.50**</td>
<td>.54**</td>
<td>.50**</td>
<td></td>
</tr>
<tr>
<td>2. Hopelessness (BHS)</td>
<td></td>
<td>-.54**</td>
<td>.54**</td>
<td>.38**</td>
<td></td>
</tr>
<tr>
<td>3. Connectedness</td>
<td></td>
<td></td>
<td>-.50**</td>
<td>-.48**</td>
<td></td>
</tr>
<tr>
<td>4. Suicide desire (BSS-5)</td>
<td></td>
<td></td>
<td></td>
<td>.41**</td>
<td></td>
</tr>
<tr>
<td>5. BPD traits (MSI-BPD)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: p<.001 = ***
Table 3. Descriptive statistics for participants with suicide desire

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<th>SD</th>
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<td>Pain (Scale of Psychache)</td>
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<tr>
<td>Hopelessness (BHS)</td>
<td>1.58</td>
<td>1.44</td>
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<tr>
<td>Connectedness</td>
<td>19.28</td>
<td>6.89</td>
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<tr>
<td>Suicide Desire (BSS-5)</td>
<td>2.81</td>
<td>1.95</td>
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<td>BPD traits (MSI-BPD)</td>
<td>4.62</td>
<td>2.27</td>
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<tr>
<td>Pain-Connectedness</td>
<td>1.34</td>
<td>1.66</td>
</tr>
</tbody>
</table>

Difference Score

Note: n=267
Figures

**Figure 1.** Probing the interaction of pain and hopelessness on suicide desire

*Note: n=852*
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Appendix

Beck Scale for Suicidal Ideation – First Five Items (BSS-5)

Please carefully read each group of statements. Pick the one statement in each group that best describes how you have been feeling. Be sure to read all of the statements in each group before making a choice.

1. I have a moderate to strong wish to live (0)  
   I have a weak wish to live (1)  
   I have no wish to live (2)

2. I have no wish to die (0)  
   I have a weak wish to die (1)  
   I have a moderate to strong wish to die (2)

3. My reasons for living outweigh my reasons for dying (0)  
   My reasons for living or dying are about equal (1)  
   My reasons for dying outweigh my reasons for living (2)

4. I have no desire to kill myself (0)  
   I have a weak desire to kill myself (1)  
   I have a moderate to strong desire to kill myself (2)

5. I would try to save my life if I found myself in a life-threatening situation (0)  
   I would take a chance on life or death if I found myself in a life-threatening situation (1)  
   I would not take the steps necessary to avoid death if I found myself in a life-threatening situation (2)

**BSS-5 Scoring**

Score of 1 or higher for the sum of 5 items indicates presence of suicide ideation. Sum all 5 items for total score.
Beck Hopelessness Scale - Short Form (BHS-Short Form)

If the statement describes your attitude for the past week, including today, select 'True'. If the statement is false for you, select 'False'.

Please be sure to read each sentence.
1. In the future I expect to succeed in what concerns me the most
   True   False

2. My future seems dark to me
   True   False

3. I just don’t get the breaks, and there’s no reason to believe that I will in the future
   True   False

4. I have great faith in the future
   True   False
Interpersonal Needs Questionnaire (INQ) – Thwarted Belongingness Subscale

The following questions ask you to think about yourself and other people. Please respond to each question by using your own current beliefs and experiences, NOT what you think is true in general, or what might be true for other people. Please base your responses on how you’ve been feeling recently.

Response scale:

1 (not true for me)
2
3
4 (somewhat true for me)
5
6
7 (very true for me)

1. These days, I feel like I belong

2. These days, I am fortunate to have many caring and supportive friends

3. These days, I feel disconnected from other people

4. These days, I often feel like an outsider in social gatherings

5. These days I am close to other people

INQ Scoring to measure connectedness

Reverse scored items: 3, 4

Total score calculated by summing the responses
MacLean Screening Instrument for BPD (MSI-BPD)

Please answer the following questions.

1. Have any of your closest relationships been troubled by a lot of arguments or repeated breakups?
   Yes  No

2. Have you deliberately hurt yourself physically (e.g., punched yourself, cut yourself, burned yourself)? How about made a suicide attempt?
   Yes  No

3. Have you had at least two other problems with impulsivity (e.g., eating binges and spending sprees, drinking too much and verbal outbursts)?
   Yes  No

4. Have you been extremely moody?
   Yes  No

5. Have you felt very angry a lot of the time? How about often acted in an angry or sarcastic manner?
   Yes  No

6. Have you often been distrustful of other people?
   Yes  No

7. Have you frequently felt unreal or as if things around you were unreal?
   Yes  No

8. Have you chronically felt empty?
   Yes  No

9. Have you often felt that you had no idea of who you are or that you have no identity?
   Yes  No
10. Have you made desperate efforts to avoid feeling abandoned or being abandoned (e.g., repeatedly called someone to reassure yourself that he or she still cared, begged them not to leave you, clung to them physically)?

Yes    No

**MSI-BPD Scoring**

Yes = 1, No = 0

Total score is calculated by summing the responses.

Alteration to scale: removed item 2 from total score.
Unbearable Psychache Scale (UP3)

The following statements refer to your psychological pain, not your physical pain. Please indicate the extent to which you disagree or agree with each of the statements using the following scale:

1 = Strongly disagree 2 = Disagree 3 = Unsure 4 = Agree 5 = Strongly agree

1. I can’t take the pain anymore
   1  2  3  4  5

2. Because of my pain, my situation is impossible
   1  2  3  4  5

3. My pain is making me fall apart
   1  2  3  4  5

UP3 Scoring

Total score calculated by summing the response to each of these items.