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A Psychosocial Approach to Predicting Self-Harm in Heterogeneous Populations

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in Heterogeneous Populations

By

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Accepted in Partial Completion
of the Requirements for the Degree
Master of Science

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Master's Thesis

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Melissa J. Sitton

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A Thesis

Presented to

The Faculty of

Western Washington University

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Abstract

Previous studies have demonstrated relationships between deliberate self-harm and psychological distress and social functioning (for a review see Nock, 2010). However, few studies have examined psychological distress and social functioning at the same time in order to compare these predictors of deliberate self-harm. Using a more comprehensive, psychosocial approach may allow more accurate predictions of deliberate self-harm. Accurate predictions could aid in the intervention and treatment of individuals who engage in deliberate self-harm, regardless of their population; that is, whether they are seeking treatment for symptoms of Borderline Personality Disorder, or if they are a member of the community. In the current study, we used a sample of individuals with Borderline Personality Disorder (N = 60) and a community sample of undergraduate college students (N = 116), all of whom reported engaging in deliberate self-harm at least once in the past year. Participants completed measures of deliberate self-harm (outcome variable), psychological distress (specifically depression, anxiety, obsessive-compulsion, and interpersonal sensitivity; predictor variables), and social functioning (positive support and negative interactions with family members, friends, and a romantic partner; predictor variables). We found that the population (or sample type) was the strongest predictor of deliberate self-harm, with individuals with Borderline Personality Disorder engaging in more deliberate self-harm than students. Additionally, anxiety predicted deliberate self-harm for individuals with Borderline Personality Disorder. No social functioning variables predicted deliberate self-harm. Explanations for findings and treatment implications are discussed.

Keywords: self-harm, distress, social support, Borderline Personality Disorder, student health

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A Psychosocial Approach to Predicting Self-Harm in Heterogenous Populations

Deliberate self-harm (DSH), or the intentional act of self-inflicted bodily injury, is of growing concern among clinical psychologists. Specifically, DSH includes behaviors such as cutting, burning, carving (marking designs or words into the skin), needle-sticking, hitting one's head or body, picking at skin, wound interference, and intentionally breaking bones (Favazza, 1998). Although there is some discrepancy in the literature regarding terminology, we use DSH as an umbrella term that encompasses self-injury completed with suicidal intent, without suicidal intent, or with ambivalence towards life (neither strictly suicidal nor nonsuicidal). Additionally, most individuals use more than one method of DSH (Favazza, 1998; Glenn & Klonsky, 2011).

According to Favazza (1998), DSH often begins in adolescence and usually persists 10-15 years. In fact, in their literature review, Rodham and Hawton (2009) found that 18 to 25 years old is the age group with the highest risk for engaging in DSH. It seems likely that DSH decreases through normative development as one's emotion regulation skills increase, coinciding with the maturing of the prefrontal cortex (involved in risk assessment, decision-making, and impulsivity). However, to our knowledge, no studies have specifically examined this theory of why DSH decreases with age. Additionally, though some early studies reported higher rates of DSH in females, more recent studies report equal DSH rates for both genders (Klonsky, 2011; Nock, 2009; for more information on gender differences in DSH behaviors, see Green & Jakupcak, 2016).

Notably, general DSH rates have increased in recent decades (Klonsky, 2007; Nock, 2009), possibly as a result of increased media coverage and exposure to DSH acts leading to increased awareness, curiosity, and comfort in disclosing (Whitlock, Purington, & Gershkovich, 2009). This increase in DSH prevalence is concerning because there is a strong relationship

between DSH and subsequent suicidal thoughts and behavior (Whitlock et al., 2013), even though not all DSH acts are initially done with suicidal intent (Linehan, 1986). Due to the increased rates and adverse outcomes, DSH has become a growing area of research in clinical psychology in recent decades (Klonsky, 2007).

As part of the effort to increase research and understanding of DSH, various models have been proposed to explain when and why DSH occurs. The Integrated Theoretical Model of DSH (Nock, 2009, 2010) is one of the most widely-recognized models because it presents a comprehensive depiction of the occurrence of DSH for adults and adolescents (see Figure 1). The first portion of the model presents several potential risk factors for future DSH behavior, including intrapersonal (i.e., biological or genetic features, such as a predisposition towards emotion dysregulation) and interpersonal (i.e., social features, such as social support and environment) facets. The second portion describes present, developed risk factors for DSH, again including intrapersonal (i.e., psychological distress) and interpersonal (i.e., social functioning) components. Next, the model depicts the sequence of events in the DSH cycle. In this, a particular stressor (of intrapersonal or interpersonal origin) interacts with the risk factors, which leads to engagement in DSH. These risk factors include the idea that DSH acts perform a number of possible functions (described as "hypotheses" in this theoretical model); in other words, individuals engage in DSH to meet a specific need or to achieve a certain goal. Lastly, the Integrated Theoretical Model of DSH demonstrates how the DSH act allows the individual to regulate their intrapersonal (i.e., emotional) or interpersonal (i.e., social) situation. This brings the individual back to their baseline level of functioning before the stressor, wherein the process can repeat itself upon exposure to another stressor. Clearly, the Integrated Theoretical Model of DSH is a comprehensive explanation of the relevant factors that occur before, during, and after

an episode of DSH; because of this, it is beneficial to understand this model before examining predictors of DSH.

Psychosocial Predictors of DSH

Identifying predictors of DSH is essential because treatment and intervention should take place as early as possible in relation to the appearance of DSH behaviors, particularly given the consequences of prolonged DSH activity. Specifically, those who continue to engage in DSH over time are more likely to do so with greater frequency, with more methods, and with increasing lethality (Andrews, Martin, Hasking, & Page, 2013). A critical first step of any intervention is to establish reliable predictors of DSH that can help clinicians identify those who might benefit from such treatment.

When attempting to establish predictors of DSH, one can focus on the first portion of the Integrated Theoretical Model of DSH (Nock, 2009, 2010) to determine what *past* risk factors predict current DSH behavior. Alternatively, one could focus on the second portion of the model to examine how *current* risk factors might relate to current DSH behavior. In other words, focusing on the second portion of the model allows one to observe what predictors are concurrent with the DSH behavior, which would seemingly be more accurate than factors that might relate to DSH at a later time. In this focus on current predictors, it is helpful to reflect on the functions of DSH, or the reported reasons that individuals engage in DSH.

The Four Function Model of DSH (Nock, 2009, 2010; Nock & Prinstein, 2004, 2005; see also Bentley, Nock, & Barlow, 2014) aligns with the hypotheses described in the Integrated Theoretical Model of DSH in suggesting that individuals decide to engage in DSH to perform a function or meet a current need. Specifically, the Four Function Model of DSH posits that DSH is maintained through both positive and negative functions that address intrapersonal (i.e.,

affective) and interpersonal (i.e., social) needs for adults and adolescents. In other words, DSH can be both positively and negatively reinforcing for intrapersonal and interpersonal needs. Intrapersonally, DSH can increase sensation or create desired affect (positive reinforcement) or decrease negative emotions or thoughts (negative reinforcement). Interpersonally, DSH can help an individual communicate with others (e.g., attention- or help-seeking; positive reinforcement) or allow an individual to escape from a given social obligation or situation (negative reinforcement). Notably, this Four Factor Model has been replicated in a confirmatory factor analysis of self-reported reasons that adolescents engaged in DSH (Nock & Prinstein, 2004).

Understanding the functions of DSH allows researchers to better recognize what factors might be relevant to predicting these maladaptive behaviors and to comprehend why these factors might be related. Especially given the intrapersonal and interpersonal functions of DSH, it is logical to examine psychological (intrapersonal) and social (interpersonal) factors that might co-occur with DSH. Specifically, relevant psychological experiences (i.e., depression, anxiety, obsessive-compulsion, and interpersonal sensitivity) and social factors (i.e., support from family, friends, and romantic partners) may be beneficial in predicting DSH.

Psychological Predictors of DSH

Historically, most DSH studies have focused on psychological features. Depression was one of the first psychological conditions investigated in the context of DSH. To date, results of this investigation are mixed and the relationship between depression and DSH remains unclear. In their literature review of DSH in adolescence, Jacobson and Gould (2007) report that adolescents from the community who engaged in DSH reported higher levels of depression than adolescents who did not engage in DSH. Other studies have found similar results with adults (e.g., Andover, Pepper, Ryabchenko, Orrico, & Gibb, 2005). Studies with psychiatric inpatient

populations also show that depression symptoms are associated with increased motivations for and intensity of DSH acts (Kumar, Pepe, & Steer, 2004), as well as with greater DSH frequency and maintenance over a six-month follow-up (Guerry & Prinstein, 2010). However, other studies report no association between depressive symptoms and DSH (e.g., Glenn & Klonsky, 2011; Kirkcaldy, Brown, & Siefen, 2007). For example, Kirkcaldy et al. (2007) found that obsessive-compulsive symptoms were the only significant predictor of DSH in their sample of adolescents, which is especially interesting given that depression and anxiety were also tested. Thus, discrepancies in the relationship between depression and DSH may be explained, in part, by the existence of other psychopathological conditions.

As Kirkcaldy et al.'s (2007) findings suggest, obsessive-compulsion is another possible psychological predictor of DSH that warrants further study. Although DSH acts can be classified as compulsive, especially behaviors such as skin-picking (McKay & Andover, 2012), most studies of DSH did not measure obsessive-compulsion until recently. Despite this lack of attention, relating DSH to compulsive disorders aligns with different functions of DSH, such as affect-regulation, impulse-control, and disassociation (Nock & Prinstein, 2004). This interpretation is supported by the finding that individuals who engage in DSH report more symptoms of obsessive-compulsion than those without a history of DSH (Croyle & Waltz, 2007; McKay, Kulchycky, & Danyko, 2000). Additionally, traits of obsessive-compulsion could help explain the strong associations between DSH and other psychological disorders, such as eating disorders (Svirko & Hawton, 2007). Such findings suggest the importance of adopting measures of obsessive-compulsion along with other psychopathological conditions to better understand all the factors that may lead to DSH.

Interestingly, anxiety has not been considered as relevant to the study of DSH as depression, and thus one might surmise that anxiety is expected to be a weaker predictor of DSH. However, the literature reveals a consistent and convincing relationship between DSH and anxiety. For example, many studies comparing individuals with and without a history of DSH found consistent evidence for the relationship between DSH and increased symptoms of anxiety (e.g., Andover et al., 2005; Jacobson & Gould, 2007; Klonsky & Olino, 2008; Klonsky, Oltmanns, & Turkheimer, 2003; Ross & Heath, 2002). Some studies also suggest that anxiety precedes DSH acts and is reduced afterward. For example, Brain, Haines, and Williams (1998) found that individuals who engaged in DSH experienced a reduction in physiological arousal (i.e., lowered heart rate, respiration, and skin conductance level) when exposed to a written script describing their specific DSH experiences. These studies provide support for anxiety as a strong predictor of DSH, but it is clear that anxiety is not the only relevant predictor. Additionally, given that anxiety is a prevalent component of many psychological disorders, including obsessive-compulsion (for more information, see American Psychiatric Association, 2013), it is worthwhile to explore whether anxiety is an individual predictor of DSH or if it contributes to the relationship between DSH and other predictors.

Interpersonal sensitivity, although seldom considered, may also be an important psychological predictor of DSH. Interpersonal sensitivity can be thought of as a psychological characteristic that influences how one relates to others. It involves the ability to perceive and psychologically respond to social judgements and attitudes with varying degrees of accuracy and appropriateness (Hall & Bernieri, 2001). Although interpersonal sensitivity has an effect on social functioning, it is more directly concerned with one's internal experience of (i.e., assessment of and reaction to) social interactions. Specifically, components of interpersonal

sensitivity include timidity, separation anxiety, a lack of interpersonal awareness, fragile inner self, and a need for approval (Boyce & Parker, 1989). Although interpersonal sensitivity has been under-studied, there is evidence of its relationship with DSH. Studies of adolescents have shown that individuals who engage in DSH report having higher levels of interpersonal sensitivity compared to those who do not engage in DSH (Kim et al., 2015; Kirkcaldy et al., 2007). Similarly, Joyce et al. (2003) found that adults with higher reports of DSH also reported higher rates of interpersonal sensitivity. These studies, though few, provide promising evidence of interpersonal sensitivity as a predictor of DSH and suggest that interpersonal sensitivity should be included in comprehensive investigations of factors predicting DSH.

In summary, there have been many attempts to determine reliable psychological predictors of DSH. When considered together, these studies help illuminate inconsistencies in identifying reliable psychological predictors. In part, this inconsistency may be due to the incomplete consideration of obsessive-compulsion and interpersonal sensitivity despite data suggesting they relate to DSH. Additionally, it is unknown how depression, obsessive-compulsion, anxiety, and interpersonal sensitivity relate to DSH (as individual predictors or as a combined set of predictors) in a comprehensive examination as opposed to isolated predictor studies. Indeed, there is a lack of consistent, clear distinction between some psychological experiences (e.g., depression and anxiety; for more information, see Leyfer & Brown, 2011), even if the subjective and clinical report of these experiences are clearly differentiated. More research is needed to examine how these four psychological variables compare and cooperate together as predictors of DSH.

Social Predictors of DSH

More research is also needed regarding the social factors related to DSH. Although DSH studies have historically focused on psychological predictors, the Integrative Theoretical Model of DSH (Nock, 2009, 2010) acknowledges both intrapersonal (i.e., psychological) and interpersonal (i.e., social) functions of DSH. Thus, despite the fact that fewer studies have examined social factors in the past compared to psychological factors, an individual's current social support (i.e., interactions with family, friends, and romantic partners) may be equally important in predicting DSH.

As Levenkron (1998) aptly phrased it, "the ways in which all the family members relate to each other… [is] the fuel that drives [DSH]" (p. 125-126). This idea is reflected in the finding that individuals who engage in DSH report less family support than those who do not engage in DSH (Rotolone & Martin, 2012). Gratz, Conrad, and Roemer (2002) also found that DSH was associated with both maternal and paternal insecure attachment in childhood. Similarly, Halstead, Pavkov, Hecker, and Seliner (2014) found that unhealthy family behavioral patterns were associated with greater frequency, severity, and duration of DSH behaviors. These findings clearly indicate that social interactions with family members relate to DSH, thereby highlighting the critical importance of looking at these factors.

Considering the increasing importance of peers in developmental psychology as one moves from childhood into adolescence, it is not surprising that support from friends also influence DSH behaviors during this time (Adrian, Zeman, Erdley, Lisa, & Sim, 2011; Tuisku et al., 2014). For example, one study demonstrated that social support from friends, but not family, during adolescence was a protective factor against future acts of DSH (Tuisku et al., 2014). Additionally, other studies of adolescents showed a relationship between DSH and both

perceived peer invalidation (Yen et al., 2015) and difficult interactions with friends (Adrian et al., 2011). These studies indicate a relationship between peer support and DSH in adolescence, but further research is required to examine the relationship. Specifically, similar studies should be conducted with young adults, who have high rates of DSH and who are generally more reliant on peers for daily social support after leaving their family of origin. To our knowledge, only two studies have examined peer support in young adults (i.e., college students); one study found that more than half of their young adult participants had friends who were aware of their DSH (Turner, Cobb, Gratz, & Chapman, 2016). The other study found that those who engaged in DSH report less support from friends than individuals without a history of DSH (Rotolone & Martin, 2012).

Similarly, as Levesque, Lafontaine, Bureau, Cloutier, and Dandurand (2010) observed, there have been remarkably few studies examining the effect of romantic partners on DSH behaviors. This is notable considering the importance of romantic relationships in development (Collins, 2003) as well as the interpersonal theories of DSH (see Bentley et al., 2014; Nock, 2009, 2010). Interestingly, Wilcox et al. (2012) found that 64% of the college students in their sample disclosed their DSH behavior to their romantic partner, suggesting that support from romantic partners may be influential in DSH behavior. Other studies suggest a link between psychological factors and social factors by demonstrating that anxiety over abandonment from a romantic partner predicts DSH thoughts and behavior (Fung, 2008; Levesque et al., 2010). Additionally, there may be a relationship between increased romantic partner support and both decreased psychological distress in adolescence (Andrews et al., 2013) and a lack of DSH behaviors in college students (Rotolone & Martin, 2012).

It is worth noting that studies considering social variables tend to focus on adolescents as the target population (as suggested by Rotolone & Martin, 2012). However, as individuals get older, the most influential relationships in their lives can change (Windle, 1994), beginning with a reliance on family members during childhood and shifting to friends and romantic partners through the course of development. Thus, it logically follows that the influence of certain relationships might be different for young adults than for adolescents. Additionally, this is an important age group to study because 18- to 25-year-olds are in the highest risk age group for DSH (Rodham & Hawton, 2009) and are commonly experiencing substantial life transitions. Because of this, future DSH studies should further examine how social support and DSH are related in young adults.

DSH in Heterogeneous Populations

In addition to psychological and social factors, there is another component that may be important in predicting DSH: population type. In other words, among individuals who engage in DSH, those who are seeking treatment for Borderline Personality Disorder may greatly differ from individuals from the general population (community samples). Thus, it is important to consider which population an individual belongs to when attempting to predict DSH.

Notably, DSH is especially prevalent in individuals with Borderline Personality Disorder (as suggested by Andover et al., 2005) with rates varying from 19 to 60% of individuals engaging in DSH at least once in their lifetime (reviewed by Bentley, Cassiello-Robbins, Vittorio, Sauer-Zavala, & Barlow, 2015). According to the American Psychiatric Association (2013), Borderline Personality Disorder (BPD) is characterized by "marked impulsivity" along with "a pervasive pattern of instability of interpersonal relationships, self-image, and affects" (p. 663). Notably, one diagnostic criterion of BPD is "recurrent suicidal behavior, gestures, threats,

or self-mutilating behavior" (p. 663). Considering that DSH is one symptom of BPD, the high rates of DSH (about 80%; Clarkin, Widiger, Frances, Hurt, & Gilmore, 1983) in this population are unsurprising.

Linehan's (1993) biosocial theory of BPD posits that DSH is the outcome of interactions between one's biological predisposition towards emotion dysregulation and an environment that magnifies this vulnerability. This theory resembles the Integrated Theoretical Model of DSH (Nock, 2009, 2010) in suggesting that both psychological and social factors are relevant to study. Additionally, given the problematic psychological and social functioning required for the diagnosis, it is logical that psychological symptoms (e.g., depression and interpersonal sensitivity) and social symptoms (e.g., negative interactions and support from family and friends) might predict DSH in this population.

Existing studies of DSH in individuals with BPD have found differences in DSH engagement from that of individuals in the community. Turner et al. (2015) found that adults with BPD engaged in DSH more recently (from time of report) and frequently than adults without BPD who engaged in DSH. Those with BPD also used more variety of methods and caused more physically-severe injuries that required medical attention. Turner and colleagues also found that adults with BPD and DSH reported more severe symptoms of depression, and were more likely to meet diagnostic criteria of an anxiety disorder than those with DSH but no symptoms of BPD.

Although the rates of DSH are higher in individuals with BPD than in the general population (see Bentley et al., 2015), DSH is still considered relatively common in the community, especially among college students (e.g., Whitlock, Eckenrode, & Silverman, 2006; Whitlock et al., 2013). College students are thought to engage in DSH more than the general

population (as suggested by Wilcox et al., 2012) with approximately 17- 41% of college students participating in DSH during their lifetime (Aizenman & Jensen, 2007; Whitlock et al., 2006) compared to 5.9% of adults in the general population (Klonsky, 2011). One possible explanation for the high rates of DSH in college students is that they are in the typical age range of DSH, particularly the high-risk age range for DSH (Rodham & Hawton, 2009). Klonsky's (2011) study of a randomly drawn community sample (obtained using random-digit dialing) confirmed this association between DSH and age; specifically, he found that 18.9% of adults under 30 years old had engaged in DSH in their lifetime, compared to 4.8% of adults over 30. Additionally, college students are typically going through developmentally-normal life transitions and stressors, which may add to overall experiences of psychological and social distress that are associated with DSH.

Notably, one study found that individuals who engaged in DSH from a community sample (individuals without a diagnosis of BPD) reported higher levels of anxiety than the "healthy" comparison group, whereas individuals with BPD did not differ in reported anxiety from the comparison group (Selby, Bender, Gordon, Nock, & Joiner, 2012). Such differences in symptom presentation between individuals who engage in DSH with and without BPD indicate the varied experiences of DSH. This suggests that DSH may have different motivations or consequences in different populations. Thus, it is worthwhile to study DSH in various populations in order to establish a more complete picture of the individuals who engage in these maladaptive behaviors.

Although individuals from the community who engage in DSH may still experience diagnosable levels of mood disorders (Selby et al., 2012), they do not often seek treatment. Interestingly, Conterio and Lader (1998) suggest that the majority of individuals who engage in

DSH (including college students) maintain approximately-normal functioning within the community, suggesting they can remain hidden to clinicians. This makes sense given that psychological distress is often an internal experience that can be difficult for others to detect, especially if those with psychological distress do not seek treatment. However, these individuals with DSH are still at risk for later suicide and other serious health consequences as a result of their DSH acts (Whitlock et al., 2013). Thus, it is important to reliably identify and treat these individuals, especially since they do not often seek treatment. Consequently, it is important to continue studying community samples of individuals who engage in DSH, especially college students, in order to establish reliable predictors that are unique to each population.

Current Study

By focusing on individual psychological or social factors, a wealth of research has identified factors that may be associated with the occurrence of DSH. Nonetheless, the literature lacks a complete and reliable combination of factors that can predict DSH. This may stem from the lack of a comprehensive psychosocial approach designed to consider the intersection between psychological and social variables. Additionally, as Jacobson and Gould (2007) point out, most research on DSH has considered either a sample of individuals with BPD or a community sample without considering potential differences in predictors between these populations. Comparing individuals who engage in DSH in heterogeneous populations allows researchers to determine if there are different predictors of DSH behaviors for each population.

The current study uses a comprehensive psychosocial approach to examining psychological and social variables in both a sample with BPD and a sample from the community to characterize how key factors may intersect in predicting DSH. The first goal of the study was to examine differences in DSH expression within the two populations. In particular, we were

interested in examining how the samples compare in the total frequency of DSH and frequency of each DSH intent (nonsuicidal, ambivalent, and suicidal).

The second goal of the current study was to determine what psychosocial predictors (combined and alone) predict DSH for each population. In this, we examined the psychological experiences of individuals with DSH as opposed to their response to their experiences (i.e., emotion regulation skills). We expect that psychological variables will be stronger predictors of DSH than social variables due to the consistency in the literature in finding a relationship between psychopathology and DSH. Indeed, the higher rates of DSH in individuals with BPD suggest that psychopathology is involved and therefore can be used to predict DSH. Thus, we expect all psychological predictors will be statistically significant when considered together. Individually, we expect that anxiety will be the strongest predictor of DSH because of the consistent (if limited) findings in the literature. Additionally, we expect that social variables will add to the prediction of DSH when considered together, given the importance of social environment with mostly adolescent samples.

The third goal of the current study was to determine if the predictors of DSH varied by population. We expect that population (or sample type) will influence the relationship between the predictors and DSH. In other words, we expect there to be differences in the influences of psychological and social variables between the sample of individuals with BPD and the community sample. We had no specific hypotheses as to the direction of the difference between samples, or the differences of individual variables.

Method

Participants and Procedure

This study included two separate subject pools: one sample of individuals with BPD and one community sample. For both subject pools, our inclusion criteria involved the requirement that participants have a history of DSH with at least one self-reported episode of DSH in the past year. We used recent DSH acts as inclusion criteria in the current study so that the measures of *current* psychological and social functioning would be appropriate considerations, rather than examining current functioning with a retrospective report of DSH after several years.

The first sample included data from a larger study of the efficacy of Dialectical Behavior Therapy in community teens and adults. Several counselors in Bellingham, WA offered participation in a research study of Dialectical Behavior Therapy to clients with traits of BPD. In other words, participants were recruited to several community-based counselors who offered treatment for symptoms of BPD, and individuals who agreed to the treatment were offered participation in the accompanying study. We used this existing data as our sample of individuals with BPD (BPD-Tx; $N = 62$). In this sample, 96.8% of participants ($N = 60$) reported engaging in DSH in the past year and thus were included in the current study. This rate of DSH is comparable to other studies with participants with BPD (e.g., Andión et al., 2012). As part of the study, participants were asked to fill out measures before beginning Dialectical Behavior Therapy, after approximately 24 weeks of treatment, post-treatment (48 weeks), and then at a three-month follow-up. We only used pretest data collected between 2008 and April 2018 from this sample so that there would not be systematic effects of treatment. We only analyzed data from the participants who reported engaging in DSH in the past year ($N = 60$; 96.8%). Participants in this study were mostly young (age: $M = 23.53$ years, $SD = 6.85$ years, range = 14

– 48). There were 49 females (81.7%), eight males (13.3%), and three participants who identified as non-binary or androgynous (5.0%). Most BPD-Tx participants identified as white/Caucasian (83.3%); other participants identified as Asian-American (61.7%), Hispanic/Latinx (1.7%), multiracial (10.0%), or other (1.7%). A majority of this sample (80.0%) reported no previous use of counseling services before the current treatment. Data on sexual orientation and living situations were not gathered from this sample.

The second subject pool consisted of undergraduate students in introductory psychology courses at Western Washington University, which served as our community sample. Of the 536 students who participated, 43.8% of students reported engaging in DSH at some point during their lifetime; this proportion of students is high compared to some other student samples (e.g., Whitlock et al., 2006; Wilcox et al., 2012), though it aligns with another measure performed with the same university sample (K. Church, personal communication, March 14, 2018). This lifetime rate of DSH also is comparable to that found in a university sample in at least one other study (i.e., Gratz et al., 2002). Additionally, 116 students (21.6%) met the inclusion criteria of the current study of self-harming in the past year. This rate of DSH in the past year is also higher than some other studies have found (e.g., Whitlock et al., 2006), but is comparable to the high DSH rate found in one other study (i.e., Gratz et al., 2002).

It is worth noting that a majority of the 536 students we recruited for this study were female (73.9%). With our inclusion criteria of engaging in DSH within the last year, the remaining 116 student participants were also mostly female (78.4%). We found no significant differences between males and females in past year engagement in DSH; however, individuals who identified as non-binary or androgynous (N = 6; 1.1% of students) were more likely to report engaging in DSH in the past year than males or females.

This sample was also mostly young (age: M = 19.62, SD = 1.58 range = 18 – 27). There were 89 females (78.4%), 23 males (19.8%), and four student participants who identified as non-binary or androgynous (4.0%). Most student participants identified as white/Caucasian (69.0%) or multiracial (19.8%); other participants identified as Asian-American (6.0%) and Hispanic/Latinx (4.3%). Student participants' self-reported sexual orientations were as follows: 60.3% heterosexual, 6.9% homosexual, 18.1% bisexual, 7.8% pansexual, 1.7% asexual, and 1.8% who identified as "other." Most reported living with friends or in a dorm (79.3%), though others lived alone (8.6%), with a romantic partner and/or kids (6.9%), with parents/guardians (0.9%), or some combination of these (4.3%). Additionally, a majority of student participants (77.6%) had received counseling services at some point in their lives; about one-fifth reported currently seeing a counselor (22.4%). Most student participants reported seeking counseling services for stress- and mood-related difficulties; notably, no student participants reported treatment for symptoms related to BPD.

During recruitment, we only told the student participants that the study was called "Emotional and Behavioral Responses to Stress" and that they might find it distressing. However, we explicitly told student participants the study's purpose in the informed consent. We also provided them with an extensive debriefing form that included on- and off-campus resources in order to minimize risk to their emotional well-being. This debriefing form was approved by the university's Suicide Prevention Coordinator. Student participants completed the measures online from in a lab setting in a campus computer lab so that any questions or concerns could be immediately addressed by a research assistant who was trained in suicide prevention. We offered course credit for participation.

Materials

DSH. We used the Lifetime Suicide Attempt Self-Injury Interview (LSASI; Linehan & Comtois, 1996) to examine the participants' history of DSH, including frequency, method, and intent. This 20-item measure asks about the dates of the most recent and the most severe DSH act (e.g., "when was the most recent time that you intentionally injured yourself?"). The measure also includes questions regarding the lifetime frequency that one has engaged in DSH with suicidal intent, without suicidal intent, with ambivalence (neither suicidal nor nonsuicidal), the subtotal of these (including suicidal, nonsuicidal, and ambivalent), and the number of times medical treatment was received for the DSH act. This measure also specifies the lifetime frequency for 11 different methods of DSH such as cutting, burning, hitting one's head or body, and asphyxiation. Higher scores indicate more DSH acts done by participants. The reliability was adequate for both samples (BPD-Tx sample, $\alpha = .75$; student sample, $\alpha = .73$). It makes sense that the reliability may on the low end of acceptability because one's engagement with one method of DSH (or with one intent) may not relate to their engagement with another method (or with another intent) of DSH. Additionally, the LSASI was developed to be conducted by an interviewer for clinical practice rather than as a research measure; thus, the psychometrics of the LSASI are often not assessed or reported (Crowell et al., 2013).

It is worth noting that we examined the grand total lifetime frequency of DSH acts, rather than making a dichotomous variable of history of DSH (present/absent) as many studies have done in the past. As Gratz et al. (2002) explain, using a frequency measure of DSH contributes more information about an individual's DSH experiences, especially since one can qualify as having a history of DSH whether they have experienced one or several hundred DSH episodes. Because of this, using frequency of DSH increases the researcher's ability to examine

clinically significant predictors associated with various degrees of DSH use. Similarly, we used lifetime rates of DSH for analyses rather than past year rates in order to provide more variability in the data. We only analyzed data for participants with DSH in the past year (inclusion criteria) because there is a crucial difference between individuals with a history of DSH and those with current DSH behavior (Brown, Williams, & Collins, 2007); however, using the lifetime rates of DSH for individuals who engaged in DSH in the past year provides a more comprehensive picture of their experiences of DSH, especially in regards to the intent and frequency of their DSH acts over time.

Some participants wrote more than a single number to report their DSH engagement. If a range of numbers was reported, we used the highest value because it is a greater risk to underestimate an individual's engagement in DSH (as opposed to the risk of overestimating DSH). If the participant wrote a number and a character (e.g., "?" or "+"), we used the number alone. When the participant wrote "many" or "a lot" instead of a numerical value, we used the respective group variable mean. We calculated the sum of each DSH method completed with nonsuicidal intent to determine the subtotal lifetime frequency of nonsuicidal DSH. We followed the same procedure to calculate the sum of ambivalent and suicidal DSH. We also calculated the subtotal for each separate DSH method (e.g., all past instances of cutting that were done with nonsuicidal, suicidal, and ambivalent intent). We compared this calculated subtotal to the self-reported subtotals for each method, and used the higher value for analysis. Additionally, a few participants did not report the intent of their DSH, but reported a subtotal for a specific method (e.g., cutting). For these, we used mean replacement but checked that the sum was not greater than the participant's self-reported subtotal. Lastly, we calculated a grand total for each participant by summing all DSH acts done in one's lifetime with nonsuicidal, ambivalent, and

suicidal intent; we used this grand total as our primary outcome variable. Additionally, we used a natural log transformation to address the skew of all four DSH variables (total, nonsuicidal, ambivalent, and suicidal DSH) used in analysis.

Psychological distress. The Symptom Checklist 90 Revised (SCL-90-R; Derogatis, 1994) is a thorough, psychiatric symptom checklist that gathers information regarding current psychological functioning and distress. As part of a larger study, the BPD-Tx participants completed this measure of psychological distress. Participants rate their distress level in the past week on a Likert-scale from 0 (*not at all*) to 4 (*extremely*) for each of the 90 items (e.g., "how much were you distressed by feeling critical of others?"). This measure was designed to be scored in nine factors of psychological distress: depression, anxiety, phobic anxiety, obsessive-compulsion, hostility, psychoticism, paranoid ideation, interpersonal sensitivity, and somatization. For this study, we were primarily interested in the factors of depression (13 items; e.g., "feeling hopeless about the future"), anxiety (10 items; e.g., "feeling fearful"), obsessive-compulsion (10 items; e.g., "having to double-check"), and interpersonal sensitivity (nine items; e.g., "feeling easily hurt"). The reliability was excellent ($\alpha = .97$).

The Brief Symptom Inventory (BSI; Derogatis, 1993) is a short-form measure of the SCL-90-R using the same items, rating scale, and nine factors. We used the BSI for the student participants because it is shorter and required less time for participants to complete. The BSI contains six items for depression, six items for anxiety, six for obsessive-compulsion, and four for interpersonal sensitivity. In each subscale, higher scores reflect greater levels of distress. The reliability was excellent for the student sample ($\alpha = .96$). Additionally, when we converted the SCL-90-R scores into BSI scores for the BPD-Tx sample, the reliability remained excellent ($\alpha = .95$).

For analysis, we calculated the mean score in each factor to determine the average amount of anxiety, depression, obsessive-compulsion, and interpersonal sensitivity separately. Because there were strong correlations between the SCL-90-R factors and the BSI factors (depression $r = .92$, $p < .001$; anxiety $r = .97$, $p < .001$; obsessive-compulsion $r = .95$, $p < .001$; and interpersonal sensitivity $r = .90$, $p < .001$), we used only the BSI factors in analysis for both samples.

Social functioning. The Network of Relationships Inventory (NRI; Furman & Buhrmester, 1985) is a self-report measure of current social support and negative interactions within various relationships, including with one's mother, father, two friends,[1] and a romantic partner. In this 33-item measure, participants rate the frequency of positive support or negative interactions on a Likert-scale from 1 (*little or none*) to 5 (*the most*). The positive subscales include "seeks secure base," "provides secure base," "seeks safe haven," "provides safe haven," and "companionship." The negative subscales include "conflict," "antagonism," and "criticism." Higher scores indicate more of each factor, such as more positive interactions or more negative interactions. The reliability was very good for both samples (BPD-Tx sample, $\alpha = .93$; student sample, $\alpha = .94$).

For the current study, we calculated the mean score of the items indicating that the participant received positive support, including the subscales of "seeks secure base," "seeks safe haven," and "companionship." We also calculated the mean score of the subscales of negative

[1] It is also worth noting that some BPD-Tx participants received a version of the NRI asking them to report on a "same sex friend" and an "opposite sex friend" as opposed to "one friend" and "another friend".

interactions, including “conflict,” “antagonism,” and “criticism.” We chose to leave the original scoring of high numbers indicating more of these seemingly-opposite events (positive support and negative interactions) since such events are not mutually-exclusive. That is, leaving the original scoring allows us to examine these variables as separate predictors of DSH, rather than as two ends of one spectrum. Additionally, we used natural log transformations to address the skew for negative interactions with friends.

Most participants reported positive support and negative interactions from all sources. Some participants reported on a source that completed the designated role even if that source was not technically in that role (e.g., reporting on a grandfather as a father figure). When a participant did not report a particular source (e.g., romantic partner), we did not replace the missing data across the source. Sixty-three participants (35.8%) did not report having a romantic partner, and thus the missing data for romantic partner was not replaced for these participants. On the other hand, when there was item-level missing data (i.e., a few items were skipped, but the participant reported having a romantic partner on most items), we replaced these missing values with the variable mean.

Planned Analyses

Before addressing the current study’s goals, we assessed the shape of the distribution of the composite variables for both samples separately. Following advice from Tabachnick and Fidell (1989), we defined outliers as any data points beyond three standard deviations from the mean, which we examined by group (the BPD-Tx and student samples had different means on most variables). We replaced outliers with the value that was three standard deviations above the mean. We chose this more liberal approach to outliers because we wanted to maintain as much

variability in the data as possible. It was especially important to maintain variability in the outcome variable of total DSH given that higher levels of DSH have great clinical significance.

Additionally, as part of our preliminary analysis, we examined missing data by comparing composite variables (averaged scores) when one-third to one-half of the items of the composite variable were missing compared to the composite variable after any missing data was replaced with the group variable mean (separate for each sample). If the correlations were greater than .90, we assumed no systematic patterns to the missing data.[2] In this case, we followed Tabachnick and Fidell's (1989) suggestion and used the group means to replace missing values for analysis.

We also assessed skewness and kurtosis after creating the composite variables. When the skewness and kurtosis scores were greater than the acceptable values (±1.5 and ±2, respectively), we conducted our analyses without transformation and with a logarithmic transformation to see if there are notable differences.

Next, we conducted descriptive analyses for each method of DSH (e.g., cutting, burning, self-asphyxiation, etc.) and examined the intent and severity of DSH acts separately for each sample (aligning with the first goal of the study). We also analyzed if DSH behavior differed based on demographic information separately for the two samples.

In addition, we conducted Confirmatory Factor Analyses (CFA) to address the uniqueness of our variables of interest. Specifically, we examined the anxiety, depression, obsessive-compulsion, and interpersonal sensitivity subscales of the BSI to confirm that these

[2] We found that the missing data composite variables and no-missing data composite variables were all correlated .99 or higher, $p < .001$, for both the BSI and the NRI.

factors can be treated as separate. We also conducted a CFA to assess the NRI's five sources of positive support and negative interactions (mother, father, two friends, and the romantic partner). We analyzed positive support and negative interactions separately because they are distinct constructs (not two ends of a spectrum) and because of the large number of measured variables required. Due to the large sample size required to conduct a CFA, we used the whole sample to conduct the CFAs and then conducted them again with only the student sample (any differences in the CFAs would indicate the effects of the BPD-Tx sample).

After examining the factors, we conducted hierarchical multiple regression to examine how each variable predicts total DSH (the second goal of the study) separately for each sample. We also examined the differences in predictors between the BPD-Tx and student samples; in other words, we examined the interaction between group and predictors (the third goal of the study). To do this, we examined psychological and social predictors separately, beginning with an averaged score (e.g., an average of the four psychological variables) before testing individual variables. We also centered all predictor variables around their respective means for the whole sample when testing for interactions in order to reduce the risk of multicollinearity.

When conducting the hierarchical multiple regression, multicollinearity was a potential concern, particularly when examining the individual psychological variables and individual social variables. The protocol of first examining the average of the four psychological variables (as well as the average of positive and average of negative social variables) allowed us to determine whether there is a relationship between the set of predictors and total DSH before we examined the specific predictors. This safeguard allowed us to compare the results of the individual variable regression to this averaged variable regression; for example, if the individual variable regression was significant but the averaged regression was not, that would be one

indicator of multicollinearity. We also inspected the tolerance and Variance Inflation Factors (VIF) as indicators of multicollinearity; however, as suggested by O'Brien (2007), one should be cautious in excluding variables solely based on 'rules of thumb' such as a tolerance value smaller than .10. Because of this, we used multiple sources (e.g., tolerance, VIF, correlations between variables, *p*-values, and the standard error of the regression coefficients) to determine if multicollinearity was an issue in this study.

Results

We used SPSS 24.0 and Amos 24 to analyze the data. For preliminary analysis, we tested for differences between the two samples on demographics. We found no differences between the samples based on gender or ethnicity. However, the BPD-Tx sample ($M = 23.53$, $SD = 6.85$) was older on average than the student sample ($M = 19.62$, $SD = 1.58$), $t(173) = 5.85$, $p < .001$. Additionally, the BPD-Tx sample (13.3%) reported prior experience with counseling (dichotomous variable) less often on average than the student sample (77.6%), $\chi^2(1) = 59.39$, $p < .001$.

Engagement in DSH (Goal 1)

We conducted descriptive analyses for all DSH variables. See Tables 1 (BPD-Tx participants) and 2 (student participants) for means, standard deviations, and range of scores related to DSH using untransformed data in order to examine the self-reported experiences of DSH. Using the data transformed with a natural log to address skewness, BPD-Tx participants reported engaging in nonsuicidal DSH most often ($M = 3.13$, $SD = 1.81$), followed by ambivalent DSH ($M = 1.92$, $SD = 2.02$) and suicidal DSH ($M = 0.66$, $SD = 0.90$). Student participants also reported engaging in nonsuicidal DSH most often ($M = 2.34$, $SD = 1.55$), followed by ambivalent DSH ($M = 1.07$, $SD = 1.33$) and suicidal DSH ($M = 0.45$, $SD = 0.81$). Additionally, BPD-Tx

participants (M = 3.87, SD = 1.84) reported significantly higher rates of total DSH[3] than student participants (M = 2.86, SD = 1.42), $t(96.56) = 3.73$, $p < .001$. However, BPD-Tx participants (M = 3.28, SD = 1.53) did not differ from students (M = 3.28, SD = 2.11) in the average amount of DSH methods used, $t(174) = -0.004$, $p = .997$.

In the BPD-Tx sample, we found no differences in self-harm expression (frequency, severity, and number of methods) based on gender, age, ethnicity, and counseling experience. In the student sample, we found no differences in self-harm expression (frequency, severity, and number of methods) based on age, ethnicity, living situation, and counseling experience. However, the frequency of DSH acts differed based on gender such that student participants who identified as non-binary (M = 4.64) reported significantly higher rates of DSH than both males (M = 2.80) and females (M = 2.95). There were no other differences in DSH severity or number of methods based on gender. Additionally, the number of methods differed based on sexual orientation such that student participants who identified as pansexual (M = 6.78) reported using significantly more methods of DSH compared to participants who identified as heterosexual (M = 2.79), asexual (M = 2.50), or "other" (M = 1.50). There were no other differences in DSH frequency or severity based on sexual orientation in the student sample.

Confirmatory Factor Analysis of the Psychosocial Predictors

Psychological factors. We conducted a Confirmatory Factor Analysis (CFA) using the whole sample (BPD-Tx and student participants; N = 176) to assess four psychological factors

[3] When total DSH was not transformed (but outliers still adjusted), the average lifetime frequency was 166.31 (SD = 268.69, range = 1 – 1,008) in the BPD-Tx sample and 44.10 (SD = 75.60, range = 1 – 424) in the student sample.

from the BSI using 22 items. Although the general standard is 10 participants per measured variable, we decided to run the CFA with items representing all four constructs to test their uniqueness. We used maximum likelihood as the method of estimation. The four factors are depression (with items 9, 16, 17, 18, 35, and 50), anxiety (items 1, 12, 19, 38, 45, 49), obsessive-compulsion (items 5, 15, 26, 27, 32, and 36), and interpersonal sensitivity (items 20, 21, 22, and 42). For the uncorrelated congeneric factor model, we fixed the correlations between the factors to equal zero. As shown in Table 3, the uncorrelated factor model did not have good absolute fit based on the Chi-Square, Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR) fit indices. We also analyzed the model allowing correlated factors. As shown in Table 3, the correlated factor model had good absolute fit based on the SRMR, adequate absolute fit based on CFI, RMSEA, and the Chi-Square. After analyzing the differences in the Chi-Squares of our two models (uncorrelated and correlated), we determined that the correlated model was statistically significantly better than the uncorrelated model. Thus, we selected the correlated model as the better model for this sample (see Figure 2). See Table 4 for the relative standardized weights and structure coefficients for the correlated model. The structure coefficients did not suggest a different interpretation than the pattern coefficients. All four factors had good reliability (depression, $\alpha = .89$; anxiety, $\alpha = .86$; obsessive-compulsion, $\alpha = .83$; interpersonal sensitivity, $\alpha = .82$). See Table 5 for the correlations between factors.

We followed the same procedure in conducting a CFA using only the student participants; $n = 116$) to assess four psychological factors from the BSI. We found no major differences between the CFA results (see Table 3 for fit indices), suggesting that the four psychological factors were maintained in both the BPD-Tx sample and student sample.

Social factors. We conducted two CFAs to assess the NRI. Using the whole sample (*N* = 176), the CFA assessed the five sources of positive support including the mother, father, two friends, and romantic partner. Participants reported how often they used each source for a secure base, safe haven, and companionship; thus, there were 15 measured variables. We used maximum likelihood as the method of estimation. For the uncorrelated congeneric factor model, we fixed the correlations between the factors to equal zero. As shown in Table 6, the uncorrelated factor model did not have good absolute fit based on the Chi-Square, CFI, RMSEA, and SRMR fit indices. We also analyzed the model allowing a correlation between mother and father, and a correlation between the two friends. No other factors were correlated because there was no theory to support other correlations. As shown in Table 6, the correlated factor model had acceptable absolute fit based on the Chi-Square and SRMR, and poor fit based on the CFI and RMSEA. Although these fit indices do not indicate great model fit, we proceeded with this model because it aligns with the theoretical model. After analyzing the differences in the Chi-Squares of our two models (uncorrelated and correlated), we determined that the correlated model was statistically significantly better than the uncorrelated model. Thus, we selected the correlated model as the better model for this sample (see Figure 3). See Table 7 for the relative standardized weights and structure coefficients for the correlated model of positive support. The structure coefficients did not suggest a different interpretation than the pattern coefficients. All five sources of positive support had good reliability (mother, $\alpha = .82$; father, $\alpha = .82$; friend 1, $\alpha = .82$; friend 2, $\alpha = .83$; romantic partner, $\alpha = .84$). See Table 8 for the correlations between all social factors.

We followed the same procedure in conducting a CFA using only the student participants; *n* = 116) to assess the five sources of positive social support. We found no major

differences between the CFA results (see Table 6 for fit indices), suggesting that the five sources of positive social support were maintained in both the BPD-Tx sample and student sample.

We also analyzed the five sources of negative interactions, including the mother, father, two friends, and romantic partner using the whole sample (N = 176). Participants reported how often they experienced conflict, antagonism, and conflict with each source; thus, there were 15 measured variables. We used maximum likelihood as the method of estimation. For the uncorrelated congeneric factor model, we fixed the correlations between the factors to equal zero. As shown in Table 9, the uncorrelated factor model did not have good absolute fit based on the Chi-Square, RMSEA, and SRMR fit indices; however, the model had good fit based on the CFI. We also analyzed the model allowing a correlation between mother and father, and a correlation between the two friends. Like with positive support, no other factors were correlated for negative interactions because there was no theory to support other correlations between sources. As shown in Table 9, the correlated factor model had good absolute fit based on the CFI, adequate absolute fit based on the Chi-Square and SRMR, and poor fit based on the RMSEA. Similar to positive support, we proceeded with this model for negative interactions despite imperfect model fit because this model of five sources aligns with the theoretical model. After analyzing the differences in the Chi-Squares of our two models (uncorrelated and correlated), we determined that the correlated model was statistically significantly better than the uncorrelated model. Thus, we selected the correlated model as the better model for this sample (see Figure 4). See Table 10 for the relative standardized weights and structure coefficients for the correlated model of negative interactions. The structure coefficients did not suggest a different interpretation than the pattern coefficients. All five sources of negative interactions had

very good reliability (mother, α = .95; father, α = .92; friend 1, α = .92; friend 2, α = .88; romantic partner, α = .96). See Table 8 for the correlations between factors.

We followed the same procedure in conducting a CFA using only the student participants; n = 116) to assess the five sources of negative interactions. We found no major differences between the CFA results (see Table 9 for fit indices), suggesting that the five sources of negative interactions were maintained in both the BPD-Tx sample and student sample.

In order to reduce the number of social variables, we conducted *t*-tests of positive support and negative interactions using the whole sample (N = 176). Mothers (M = 2.75, SD = 0.95) displayed more positive support than fathers (M = 2.22, SD = 0.82), $t(175) = 6.70$, $p < .001$. Additionally, mothers (M = 2.41, SD = 1.10) also displayed more negative interactions than fathers (M = 2.13, SD = 0.92), $t(175) = 2.82$, $p = .005$. We found similar results when we examined the BPD-Tx sample and the student sample individually. Given that mothers appeared to have both more positive and more negative interactions (as well as equal to higher reliability as factors of positive and negative social variables), we decided to exclude fathers from further analysis in order to reduce the number of social variables.

Similarly, we conducted *t*-tests of positive and negative interactions for the two friends using the whole sample (N = 176). Friend 1 (M = 3.26, SD = 0.90) displayed more positive support than Friend 2 (M = 2.96, SD = 0.91), $t(175) = 5.13$, $p < .001$. However, there was no difference in negative interactions (transformed to address skewness) between Friend 1 (M = 0.35, SD = 0.36) and Friend 2 (M = 0.33, SD = 0.34), $t(175) = 0.46$, $p = .646$. We found similar results when we examined the BPD-Tx sample and the student sample individually. Even though the two friends only significantly differed in positive support, we decided to exclude Friend 2 from further analysis in order to reduce the number of social variables.

After conducting the CFAs and *t*-tests, we decided to use mothers, Friend 1, and romantic partners as our individual sources of support (both positive and negative). Thus, there were six individual social variables. However, when we analyzed the average positive support and average negative interactions, we calculated the average using the original five sources: mother, father, two friends, and romantic partner (when applicable). We used an average of four sources for participants without a current romantic partner.

Psychosocial Predictors of DSH (Goal 2)

Table 11 presents all means and standard deviations for the psychological and social variables for both participant samples. We found that BPD-Tx participants reported lower rates of all four psychological variables than student participants (as well as a lower averaged psychological distress score). Additionally, BPD-Tx participants reported less averaged positive support (including all sources of support) than student participants, and specifically less positive support from their romantic partner than student participants. The BPD-Tx participants also reported more negative interactions with their mother. There were no other significant differences between samples in social variables.

See Table 12 for bivariate correlations between all predictor variables and the outcome variable for each sample. Table 12 also presents the correlations between the predictors and DSH acts done with various intent (nonsuicidal, ambivalent, and suicidal). The BPD-Tx sample showed slightly lower correlations between psychological variables than the student sample. There were minimal differences between samples in the relationships between social variables, as well as the relationships between psychological and social variables. The BPD-Tx sample also showed two variables were associated with total DSH: depression and anxiety. No other

variables related to total DSH for the BPD-Tx's sample, and no variables were related to total DSH for the student sample.

Next, we conducted separate hierarchical linear regression for each sample using total DSH as the outcome variable. We entered all psychological variables on the first block and the two average social variables on the second block for both samples. See Table 13 for regression coefficients for both samples.

For the BPD-Tx sample (Model 1), we found that the psychological variables together predicted total DSH, $F(4,55) = 6.31$, $p < .001$, $MSE = 2.49$, adjusted $r^2 = .27$. As shown in Table 13, depression, anxiety, and obsessive-compulsion were all significant unique predictors of total DSH. With the addition of all social variables on the second block, the psychological and social variables formed a significant set of predictors of total DSH, $F(6,53) = 4.18$, $p = .002$, $MSE = 2.56$, adjusted $r^2 = .24$. However, the social variables did not add to the prediction of total DSH in the BPD-Tx sample, $\Delta F(2,53) = 0.27$, $p = .768$, $\Delta r^2 = .01$. Notably, we cannot conclude from this regression alone that depression, anxiety, and obsessive-compulsion are actual unique predictors of total DSH due to the risk of multicollinearity.[4]

[4] There were strong correlations between psychological variables and moderately-high VIF values (ranging from 1.91-2.16 on the first block and 1.98-2.32 on the second block). The *p*-value for depression and obsessive-compulsion were above .01. On the other hand, tolerance was sufficiently high and the standard error of regression coefficients were adequately low. Additionally, it is worth noting that anxiety was the only significant unique predictor when total DSH was left untransformed.

For the student sample (Model 2), we found that the psychological variables together did not predict total DSH, $F(4,111) = 0.55$, $p = .697$, $MSE = 2.06$. Additionally, on the second block, the psychological and social variables together did not significantly predict total DSH, $F(6,109) = 0.69$, $p = .545$, $MSE = 2.07$. As expected, the social variables did not add to the prediction of total DSH in the student sample, $\Delta F(2,109) = 0.96$, $p = .386$. In summary, there were no significant predictors of total DSH in the student sample.[5]

Sample Differences in DSH Predictors (Goal 3)

We also examined the interaction between sample type (BPD-Tx or student) and predictor separately for psychological and social predictors to see if the influence of the predictors differed by sample. In Model 3, we entered sample type on the first block as a centered variable (BPD-Tx participants = 1, student participants = -1); this type of contrast-coding allows us to first determine if there is a difference between the two samples in relation to the outcome variable. We also entered an averaged score of the four psychological variables (centered around the mean) in the first block. We found that the sample type and average psychological distress together predicted total DSH $F(2,173) = 11.80$, $p < .001$, $MSE = 2.41$, $r^2 = .12$. As shown in Table 14, both sample type and average psychological distress uniquely predicted total DSH. With the addition of the interaction term on the second block (which we calculated by multiplying the sample type and average psychological distress variable), total

[5] The four psychological variables on the first block predicted the untransformed total DSH, $F(4,111) = 2.93$, $p = .024$, $MSE = 5355.64$, $r^2 = .09$. Specifically, depression and anxiety were significant unique predictors of total DSH when it was not transformed to address its positive skew; however, the *p*-values were close to .05 and multicollinearity may be an issue.

DSH was significantly predicted, $F(3,172) = 9.90$, $p < .001$, $MSE = 2.35$ $r^2 = .15$. The interaction term significantly added to the prediction of total DSH, $\Delta F(1,172) = 5.48$, $p = .020$, $\Delta r^2 = .03$. As shown in Table 14, sample type, psychological distress, and the interaction were all significant unique predictors of total DSH (see Figure 5).

To further examine the interaction, we conducted the regression analysis again with sample type recoded (BPD-Tx participants = 1, student participants = 0; Model 4). Coding sample type in this way allows us to use students as a reference group when probing the interaction. Again, we used sample type and the averaged psychological score on the first block, and added the interaction on the second block. The regression results mirror those of Model 3 since the change in variables was minimal. However, the results differed in the unique predictors of total DSH on the second block. As shown in Table 14, sample type and the interaction were unique significant predictors of total DSH, but average psychological distress became nonsignificant on the second block. The significant interaction indicates that the association between average psychological distress and total DSH was stronger for the BPD-Tx sample than for the student sample (see Table 14). Specifically, total DSH (transformed) increased by 0.21 standard deviations more for BPD-Tx participants than for student participants as average psychological distress increased.

After finding that the influence of general psychological distress differed between samples, we conducted another regression analysis to examine which specific psychological variables differed between samples (Model 5). We entered sample type (BPD-Tx participants = 1, student participants = -1) on the first block along with the four psychological variables (all centered around their means). We found that the sample type and psychological variables together predicted total DSH $F(5,170) = 6.89$, $p < .001$, $MSE = 2.32$, $r^2 = .17$. Specifically,

sample type, anxiety, and obsessive-compulsion all uniquely predicted total DSH (see Table 15). With the addition of the four interaction terms on the second block (which we calculated by multiplying the sample type and each psychological variable individually), total DSH was again significantly predicted, $F(9,166) = 5.44$, $p < .001$, $MSE = 2.20$. The interaction terms significantly added to the prediction of total DSH, $\Delta F(4,166) = 3.19$, $p = .015$, $\Delta r^2 = .06$. As shown in Table 15, sample type, depression, anxiety, and obsessive-compulsion were unique predictors of total DSH;[6] however, one cannot definitively conclude that these are unique predictors of total DSH using only this regression due to the risk of multicollinearity.[7] The only significant interaction in Model 5 was between sample type and anxiety (see Figure 6).

To further examine the significant interaction between sample type and anxiety, we recoded the sample type (BPD-Tx participants = 1, student participants = 0; Model 6). As expected, we found that the sample type and anxiety together predicted total DSH $F(2,173) = 13.76$, $p < .001$, $MSE = 2.36$, $r^2 = .14$. Both sample type and anxiety were unique significant predictors of total DSH. After adding the new interaction term on the second block, total DSH was still significantly predicted, $F(3,172) = 12.00$, $p < .001$, $MSE = 2.28$. The interaction term

[6] Notably, when we examined the untransformed total DSH, the unique predictors included sample type, anxiety, interpersonal sensitivity, and the interactions involving anxiety and interpersonal sensitivity.

[7] There were strong correlations between psychological variables and high VIF values (ranging from 2.36-2.44 on the first block and 2.64-2.89 on the second block). The *p*-values for depression and obsessive-compulsion were above .01. On the other hand, the tolerance was sufficiently high and the standard error of regression coefficients were adequately low.

significantly added to the prediction of total DSH, $\Delta F(1,172) = 7.44$, $p = .007$, $\Delta r^2 = .04$. As shown in Table 15, sample type and the interaction were unique significant predictors of total DSH, but anxiety became nonsignificant on the second block. The significant interaction revealed that anxiety was more related to total DSH in the BPD-Tx sample than in the student sample. Specifically, total DSH (transformed) increased by 0.26 standard deviations more for BPD-Tx participants than for student participants as anxiety increased.

Next, we wanted to examine if the influence of positive social support and negative interactions differed between the samples (Model 7). We entered sample type on the first block (BPD-Tx participants = 1, student participants = -1) as well as the average of all positive social variables and the average of all negative social variables. We found that the sample type, averaged positive support, and averaged negative interactions together predicted total DSH $F(3,172) = 5.86$, $p = .001$, $MSE = 2.50$, $r^2 = .09$. Specifically, only sample type uniquely predicted DSH (see Table 16). With the addition of the interaction terms on the second block, total DSH was also significantly predicted, $F(5,170) = 3.72$, $p = .003$, $MSE = 2.51$. However, the interaction term did not significantly add to the prediction of total DSH, $\Delta F(2,170) = 0.55$, $p = .575$, $\Delta r^2 = .01$. See Table 16 for the regression coefficients.

Even though we found no significant interaction between sample type and general positive social support or negative interactions, we conducted another regression analysis to examine if any specific social variables differed between samples. In this, we analyzed the positive social variables (Model 8) separately from the negative social variables (Model 9) due to concerns with our sample size. We entered sample type (BPD-Tx participants = 1, student participants = -1) on the first block along with two positive social variables (mother and Friend 1, centered around their means). We found that the sample type and the two positive social

variables together predicted total DSH $F(3,172) = 6.52$, $p < .001$, $MSE = 2.47$, $r^2 = .10$. Specifically, only sample type uniquely predicted total DSH. With the addition of the interaction terms (each social predictor multiplied by the sample type) on the second block, total DSH was significantly predicted, $F(5,170) = 4.23$, $p = .001$, $MSE = 2.48$. However, the interaction terms did not significantly add to the prediction of total DSH, $\Delta F(2,170) = 0.80$, $p = .450$, $\Delta r^2 = .01$. Sample type was the only unique predictor of total DSH (see Table 17).

Additionally, we analyzed Model 8 a second time using only participants who had a current romantic partner ($N = 113$). On the first block, we entered sample type (BPD-Tx participants = 1, student participants = -1) and the three individual sources of positive social support (mothers, Friend 1, and romantic partners). We found that the sample type and the three positive social variables together predicted total DSH $F(4,103) = 2.63$, $p = .038$, $MSE = 2.15$, $r^2 = .09$. Specifically, only sample type uniquely predicted total DSH (see Table 17). However, the second block (with the addition of the interaction terms) did not predict total DSH, $F(7,105) = 1.62$, $p = .137$, $MSE = 2.19$. The interaction terms did not significantly add to the prediction of total DSH, $\Delta F(3,105) = 0.35$, $p = .793$, $\Delta r^2 = .01$.

Next, we entered sample type and two negative social variables on the first block using the whole sample. We found that these predicted total DSH, $F(3,172) = 5.91$, $p = .001$, $MSE = 2.50$, $r^2 = .09$. However, sample type was the only unique predictor of total DSH (see Table 18). After the addition of the interaction terms on the second block, total DSH was significantly predicted, $F(5,170) = 3.86$, $p = .002$, $MSE = 2.50$. However, the interaction term did not significantly add to the prediction of total DSH, $\Delta F(2,170) = 0.81$, $p = .447$, $\Delta r^2 = .01$.

Lastly, we analyzed Model 9 a second time using only participants who had a current romantic partner ($N = 113$). On the first block, we entered sample type (BPD-Tx participants =

1, student participants = -1) and the three individual sources of negative interactions (mothers, Friend 1, and romantic partners). We found that the sample type and the three negative social variables together predicted total DSH $F(4,108) = 2.56$, $p = .042$, $MSE = 2.15$, $r^2 = .09$. Specifically, only sample type uniquely predicted total DSH (see Table 18). However, the second block (with the addition of the interaction terms) did not predict total DSH, $F(7,105) = 1.66$, $p = .128$, $MSE = 2.18$. The interaction terms did not significantly add to the prediction of total DSH, $\Delta F(3,105) = 0.50$, $p = .686$, $\Delta r^2 = .01$.

Discussion

The primary goals of the current study were to better understand how the experience of DSH varies by population (BPD-Tx vs. community), and to establish a more comprehensive set of predictors of DSH. This study was unique in its psychosocial approach to predictors. Additionally, we examined the interaction between sample and predictor, which is a unique strength of this study.

DSH Engagement (Goal 1) and Demographics

Our results demonstrate very high lifetime frequency of DSH in both samples. Although most studies do not report the lifetime frequency rates of DSH of their participants, the frequency of DSH in our student sample is comparable to that found in another study of students using the same DSH methods (Cryole & Waltz, 2007). The frequency rate of DSH in the BPD-Tx sample appears to be lower than found in some other studies with individuals with BPD (e.g., Turner et al., 2015), but this may be due to our more conservative approach to outliers. Additionally, we found that the lifetime frequency rates of DSH were higher in the BPD-Tx sample than in the student sample.

The finding that BPD-Tx participants reported higher frequency of total DSH than student participants aligns with previous studies (e.g., Klonsky & Olino, 2008; Turner et al., 2015). This higher frequency of total DSH makes sense given the maladaptive behaviors often seen in individuals with BPD. Alternatively, the higher DSH frequency reported by the BPD-Tx participants may serve to solicit attention, which is often a strong impulse associated with a diagnosis of BPD. According to Linehan (1993), DSH is commonly used by individuals with BPD as a way to communicate and gain attention from others. It is worth noting that, despite the typical inverse relationship between DSH engagement and age, the BPD-Tx sample was older than student participants on average. However, given the strong established relationship between BPD and DSH, perhaps age was less related to decisions to engage in DSH for individuals with BPD.

One interesting finding of this study was that both BPD-Tx participants and student participants report engaging in ambivalent DSH (without a distinct intention to die or lack of intention to die) more than suicidal DSH but less than nonsuicidal DSH. This makes sense given that individuals may feel apathy towards life more often than they feel negatively or hopelessly about life (suicidal). However, this finding does not reflect Chapman and Dixon-Gordon's (2007) findings that their participants engaged in suicidal DSH more than ambivalent DSH (but still less than nonsuicidal DSH). This difference in findings could be explained by the chosen sample: Chapman and Dixon-Gordon used a sample of adult female inmates, who may experience different stressors and motivations in their DSH behaviors than the current study's samples of young adults with BPD and college students.

Interestingly, despite higher rates of total DSH, BPD-Tx participants reported less average psychological distress (as well as lower rates in all of the individual psychological

variables) than student participants. This is contrary to our expectations, and contrary to the findings of many other studies of a strong association between one or more of these psychological variables and engagement in DSH for individuals with BPD (e.g., Sadeh et al., 2014; Turner et al., 2015). It is possible that the baseline level of psychological distress is higher in BPD-Tx participants than in student participants, leading these negative emotions to be considered normal and therefore not "distressing."[8] In other words, if these negative emotions are normalized, BPD-Tx participants may become numb to the distress, and feel the negative emotions less saliently than student participants. Additionally, given that more BPD-Tx participants reported no prior experience with counseling than did student participants, it could be that BPD-Tx participants reported less psychological distress due to a lack of emotional self-awareness. This aligns with Turner et al.'s (2015) finding that participants with BPD who engage in DSH reported less awareness of their emotional states. Similarly, given that the BPD-Tx participants were in the process of beginning a new form of treatment (after long waitlists, for many), it is possible that the lower self-reported distress was due in part to increased levels of hope that the new treatment would be effective.

Socially, BPD-Tx participants reported less average positive social support than student participants, as well as more negative interactions with their mothers than student participants. This aligns with the biosocial theory of BPD (Linehan, 1993) which suggests that individuals with BPD may experience (or interpret their experience as comprising of) an invalidating environment. Another possible explanation is that BPD-Tx participants may be more likely to

[8] The SCL-90-R and BSI ask participants to rate how much distress they felt when faced with various psychological and behavioral experiences in the past week.

interpret interactions with others as negative. This aligns with Westlund Schreiner et al.'s (2017) suggestion that individuals with DSH may be prone to interpreting facial stimuli as negative as opposed to neutral or positive, based on their neuroimaging study of female adolescents. Thus, it may be that the BPD-Tx participants (who engage in more DSH) are more likely to interpret interactions with their mothers as negative compared to the student participants. This idea also aligns with Peters, Smart, and Baer's (2015) finding that individuals with traits of BPD often demonstrated maladaptive responses to emotional experiences, which lead them to interact negatively with others. These explanations may also be relevant to understanding why BPD-Tx participants reported less positive support from romantic partners than did student participants.

Notably, BPD-Tx participants reported more positive support and negative interactions with their mothers than their fathers, suggesting that mothers may be more involved in their lives. Student participants also reported significantly more positive support from their mothers, though the difference between parents in negative interactions was not significant.

Psychosocial Predictors of DSH (Goal 2)

Our regression analysis revealed that psychological variables predicted total DSH in the BPD-Tx sample. Specifically, average psychological distress and anxiety predicted total DSH for BPD-Tx participants. It is also possible that depression is involved in predicting total DSH based on the regressions and correlational analysis, though there is not enough evidence to draw conclusions at this time. Although social variables did not improve the prediction of DSH, it is possible that social variables are indirectly related to total DSH. For example, the averaged negative interactions (which includes all sources of social interactions) was positively related to average psychological distress as well as to anxiety, obsessive-compulsion, and interpersonal sensitivity, specifically. Because of these relationships, it is possible that social factors

contribute to psychological experiences, which then predict total DSH. Thus, despite the fact that we found no significant social predictors of DSH in the BPD-Tx sample, it is possible (and likely, based on theory) that social variables are still involved in DSH engagement.

Additionally, the correlational analysis suggests that various psychological predictors may be differentially relevant for the various DSH intents (nonsuicidal, ambivalent, and suicidal) in the BPD-Tx sample. Specifically, anxiety was associated with all three DSH intents, whereas depression was related only to total DSH and ambivalent DSH. Examining the intent types also provides insights to our primary results. For example, anxiety was the only predictor that was associated with nonsuicidal DSH in the BPD-Tx sample; since nonsuicidal DSH constitutes a majority of total DSH, it makes sense that anxiety was the strongest predictor of total DSH in the BPD-Tx sample.

Contrary to our expectations, there were no significant predictors of total DSH in the student sample. However, we did find some interesting relationships between the predictor variables. Specifically, similar to the BPD-Tx sample, the averaged negative interactions (including all sources of social interactions) score was related to average psychological distress for students. The averaged negative interactions score was also related to all four individual psychological variables. Thus, the social variables and psychological variables appear to be related in the student sample.

Similar to the BPD-Tx sample, examining the DSH intent types provides more information about the relationships between the predictors and DSH in the student sample. For example, all four individual psychological variables (as well as average psychological distress) were all associated with ambivalent and suicidal DSH for student participants. On the other hand, no variables were associated with nonsuicidal DSH; this finding helps explain why there

were no significant predictors of total DSH in the student sample, given that nonsuicidal DSH made up the majority of the total DSH variable.

The lack of predictors in the student sample may also be attributable to the lower severity of DSH that is often seen in community samples. Klonsky and Olino (2008) found that almost two-thirds of their college-student sample (all of whom had a history of DSH) reported low lifetime rates of DSH and few symptoms of psychological distress. Because of this, Klonsky and Olino concluded that this group may consist of individuals who were "experimenting" with DSH, as opposed to individuals who rely on DSH as a means of coping with psychological distress. Similarly, our student sample may have included individuals who used DSH only intermittently and whose DSH was unrelated to their overall feelings of psychological distress (impulsive DSH). However, it is worth noting that the four psychological variables together were able to predict total DSH when it was left untransformed (allowed to have a positive skew) for student participants. Although we were unable to find predictors of total DSH when it was transformed, the predictors of untransformed total DSH suggests that perhaps psychological distress predicts DSH for students who have engaged in DSH more frequently in their lifetime than other students. Notably, these students who engaged in DSH more may be similar to individuals with BPD in their lifetime frequency of DSH. Because of this, it is possible that the main difference between the two populations (accounting for the statistically significant interactions we found) is the amount of DSH as opposed to another innate characteristic that differentiates the populations.

Another possible explanation for the lack of total DSH predictors in the student sample is that other variables may be involved in predicting DSH that were not considered in this study, such as emotion regulation skills. In other words, it could be that DSH frequency is more related

to one's ability to regulate psychological distress (such as anxiety) rather than the presence of psychological distress itself. As Nock (2009) suggests, emotional reactivity is a risk factor for DSH; thus, the ability to regulate emotions effectively should be associated with decreased or no reported DSH. In fact, Levesque et al. (2010) found that emotion regulation acted as a mediator between attachment to a romantic partner and DSH. Similarly, Adrian et al. (2011) found that emotion regulation skills partially mediated the relationship between family (and peer) relationship problems and DSH. Thus, it is possible that the current study found no significant predictors of total DSH for students because we did not examine all the relevant variables.

Sample Differences in DSH Predictors (Goal 3)

When we examined the whole sample to test for interactions, we found that psychological variables predicted total DSH. Specifically, anxiety was the strongest individual psychological predictor. This finding is consistent with the fact that anxiety was related to the most DSH intent types in the correlational analysis. Additionally, the interaction between sample type and anxiety (wherein anxiety was more related to DSH in the BPD-Tx sample) is also corroborated by the correlational results, which found that anxiety was related to all intent types in the BPD-Tx sample but only with ambivalent and suicidal DSH in the student sample.

The finding that anxiety predicted total DSH in the BPD-Tx sample aligns with previous literature. For example, Klonsky and Olino (2008) conducted a latent class analysis and found that the group of individuals with the most DSH also reported symptoms of BPD and anxiety. Interestingly, this group reported using DSH regularly (explaining the high lifetime rates of DSH) and as a means of emotion regulation (explaining the relationship between psychological distress and DSH). Additionally, the association between anxiety and total DSH for BPD-Tx participants aligns with Sadeh et al.'s (2014) finding that BPD symptoms related to the affect-

regulating function of DSH. The significant interaction we found between anxiety and sample type resembles Andover et al.'s (2005) finding that BPD symptoms accounted for the relationship between anxiety and DSH. However, in our study, anxiety remained a significant predictor of DSH in the BPD-Tx group; in other words, sample type was a moderator between anxiety and DSH as opposed to a mediator.

It is worth noting that we found different results when we conducted the regression with total DSH untransformed (positively skewed). Specifically, anxiety, interpersonal sensitivity, and the interactions between sample and anxiety and interpersonal sensitivity were significant when total DSH was untransformed. With the interaction, anxiety was more related to total DSH for the BPD-Tx sample whereas interpersonal sensitivity was more related to total DSH for the student sample. These findings suggest that individuals who have engaged in DSH more in their lifetime may experience a stronger relationship between the total DSH and either anxiety (BPD-Tx sample) or interpersonal sensitivity (student sample), depending on the sample type. Given that total DSH was more skewed and more leptokurtic in the student sample, the effect of the transformation of total DSH was likely stronger for student participants.

Social variables did not predict total DSH in any of the regression models conducted in the current study. This finding is contrary to the Integrated Theoretical Model of DSH (Nock, 2009, 2010) and the majority of the literature which demonstrate a relationship between social support and engagement in DSH (e.g., Whitlock, Prussien, & Pietrusza, 2015; Wilcox et al., 2012). However, in both samples, social variables (particularly the averaged negative interactions score) were related to psychological variables, suggesting that social variables could be indirectly related to DSH through the psychological variables.

One possible explanation for why we did not find a direct relationship between social variables and DSH is that the reliability for the positive support sources (mother, friend, and romantic partner) were not great despite being in the acceptable range. Beyond these statistical explanations for our results, it is possible that there was variability in the data that contributed to the nonsignificant findings that stemmed from inconsistent timing of social support. Specifically, it is unclear if positive support preceded DSH engagement (which would decrease DSH frequency, in theory), or proceeded DSH (which might not be related to total DSH frequency), or both. Turner et al. (2016) found that perceived social support increased after participants disclosed their DSH acts to others. However, they also found that this increased support was associated with increased DSH urges and acts the following day, presumably because the DSH had achieved the desired interpersonal function. Thus, even though DSH behavior was related to social support in Turner et al.'s study of adults in the community, the lack of a clear, linear relationship between DSH and social support may have contributed to nonsignificant findings of social predictors of DSH in the current study.

Notably, the most consistent predictor of total DSH found in all regression models was the sample type, with BPD-Tx participants showing greater frequency of total DSH than student participants. In fact, sample type was most reliable predictor, likely causing several of the regression models to be significant, based on the fact that sample type was the only significant unique predictor for some. This aligns with the findings of Turner et al.'s (2015) comparison of individuals who engage in DSH with and without traits of BPD; specifically, those with BPD demonstrate more DSH frequency and severity as well as more symptoms of emotion dysregulation.

Limitations

One limitation of the current study is that we focused on total DSH as the outcome variable, as opposed to examining the DSH intent subtypes. Although we did not analyze the various DSH intents using regression, the correlations between the predictors and DSH intents produced some interesting results; it is possible that we would have found more significant predictors if we had conducted the multiple regression separately for the various intents of DSH. Based on the different values when comparing the BPD-Tx and student sample correlations, there may also be some interesting interactions between psychological predictors and sample type for the different DSH intent types. These results suggest that predictors of DSH may vary by DSH intent, which might have contributed to our lack of many significant findings after combining the DSH intents into a single outcome variable.

Additionally, the inclusion criteria may have indirectly served as a limitation to our study. Specifically, we included only individuals who reported engaging in DSH in the past year because we wanted to examine current predictors of current behavior. However, it is possible that psychological distress and social support are more effective predictors of future DSH acts. In other words, it may be more accurate to state that the current study examined predictors of the frequency of DSH using current psychosocial functioning, whereas the psychosocial variables might have been better at predicting if an individual will engage in DSH in the future or not. This theory aligns with Heath, Ross, Toste, Charlebois, and Nedecheva's (2009) interpretation of their lack of results linking social support to lifetime rates of DSH; specifically, they suggest that social support may relate more to differences between those who will engage in DSH compared to those who will not, as opposed to the degree (i.e., frequency) of DSH. It is unclear how the results may have differed if we included a comparison group of individuals who do not engage in

DSH (or have never engaged in DSH) as opposed to comparing individuals with a history of engaging in DSH from different populations in the current study.

Another limitation of the current study was the requirement to use specific measures in order to compare the student sample to the existing BPD-Tx sample. For example, although the Lifetime Suicide Attempt Self-Injury Interview (LSASI) measure of DSH was helpful in asking about various intents of DSH (including ambivalent, which is not commonly measured), it was originally intended to be used during a clinical interview as opposed to a self-report measure. In other words, the LSASI was designed to be completed by a trained clinician and therefore it is not a simple and intuitive measure for participants to fill out themselves. This lead to a lot of missing data from skipped items. One example is the item that asked for participants to report the amount of DSH they engaged with nonsuicidal and suicidal intent in the last year, which was almost always left blank for the BPD-Tx participants. Additionally, for both BPD-Tx and student participants, it was unclear at times if no response to an item meant that they had no history of that DSH method (e.g., cutting), or if they were skipping the question because they preferred not to answer it. Consequently, there was a great deal of missing data as well as inconsistencies in the frequencies of DSH reported. Although our data protocol helped address some of these issues, it is possible that another DSH measure that was designed to be self-report might have provided more accurate information about our participant's DSH history and current behavior. Thus, the fact that the current study was restricted to using certain measures is a potential limitation.

Lastly, this study may have suffered from a lack of power. Although we met the minimum requirement for sample size for regression (five participants per predictor, according to Tabachnick & Fidell, 1989), we did not meet the ideal recommendation of 20 participants per

predictor. Increasing our sample size likely would have increased the power in this study, perhaps allowing us to detect predictors with smaller effect sizes than we were able to currently.

Implications and Future Directions

Our findings have several treatment implications. Given that anxiety predicts total DSH in individuals with BPD, clinicians should pay close attention to the level of anxiety of their patients with BPD. Patients with high anxiety will likely engage in more DSH than those low anxiety, and thus the clinician may be able to intervene before the patient engages in a high frequency of DSH. Treatment protocols could also focus on lowering anxiety to see if that will decrease DSH behavior; however, given that the current study's findings are not casual, it is unclear if lowering anxiety levels will affect DSH behaviors in patients with BPD. On the other hand, universities and other institutions that are concerned with mental health in the community may want to utilize DSH screening tools that are more comprehensive rather than focusing solely on psychological or social factors.

Future studies should continue to examine psychosocial predictors of DSH with larger and more diverse samples in order to explore the relationships between psychological and social predictors. Additionally, future studies should explore other relevant factors with the psychosocial predictors, such as emotion regulation, in order to determine if other factors may better explain (or mediate the relationships with) DSH. Moreover, longitudinal and experience-sampling designs would allow researchers to gain better understanding of how changes in psychosocial functioning relate to decisions to engage in DSH as well as the exact sequence of events for DSH acts. Although some studies have recently begun using these techniques, a more psychosocial approach to predictors and consequences of DSH (also considering various intents)

may provide more prudent information that can be used to intervene and treat individuals who engage in DSH from heterogeneous populations.

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Table 1

Descriptive Statistics for Self-Harm Acts in One's Lifetime for Borderline Personality Disorder Treatment (BPD-Tx) Participants (N = 60)

Variable	*N*[a]	*M (SD)*[b]	Range[b]	*N* with Severe Cases[a]
Cutting	52	90.34 (*204.40*)	0 to 1,008	9
Hitting head/body	33	44.50 (*106.63*)	0 to 500	0
Overdosing	30	12.67 (*71.35*)	0 to 500	17
Burning	25	4.74 (*15.03*)	0 to 100	0
Stabbing/puncturing	16	4.77 (*16.69*)	0 to 100	1
Asphyxiating	5	5.24 (*31.22*)	0 to 200	0
Strangling/hanging	5	0.48 (*1.77*)	0 to 10	0
Drowning	4	0.10 (*0.31*)	0 to 1	0
Poisoning	2	0.05 (*0.23*)	0 to 1	0
Other	26	59.70 (*186.53*)	0 to 1,006	0

Note. The descriptive statistics are based on the total self-harm reports, combing self-harm acts completed with suicidal intent, nonsuicidal intent, and with ambivalence. Other = participant reported engaging in a type of self-harm that was not listed.

[a] The number of BPD-Tx participants in our sample who reported engaging in the behavior (*N*) and seeking medical treatment as a result of their self-harm behavior (*N* with Severe cases).

[b] The frequency that BPD-Tx participants reported engaging in the various methods of self-harm.

Table 2

Descriptive Statistics for Self-Harm Acts in One's Lifetime for Student Participants (N = 116)

Variable	*N*[a]	*M (SD)*[b]	Range[b]	*N* with Severe Cases[a]
Cutting	85	15.86 (*27.57*)	0 to 200	10
Hitting head/body	70	8.90 (19.*08*)	0 to 125	3
Overdosing	32	2.05 (*14.06*)	0 to 150	8
Burning	36	1.69 (*6.70*)	0 to 50	3
Stabbing/puncturing	35	2.93 (*11.84*)	0 to 100	2
Asphyxiating	22	0.50 (*1.53*)	0 to 10	2
Strangling/hanging	18	0.46 (*1.67*)	0 to 12	1
Drowning	19	0.39 (*1.09*)	0 to 6	1
Poisoning	12	0.16 (*0.51*)	0 to 3	1
Other	37	17.42 (*99.68*)	0 to 1,000	7
Jumping	8	0.26 (*1.21*)	0 to 10	3
Shooting with gun	1	0.01 (*0.09*)	0 to 1	0

Note. The descriptive statistics are based on the total self-harm reports, combing self-harm acts completed with suicidal intent, nonsuicidal intent, and with ambivalence. Other = participant reported engaging in a type of self-harm that was not listed; Jumping = jumping from a high place to cause self-harm.

[a] The number of student participants in our sample who reported engaging in the behavior (*N*) and seeking medical treatment as a result of their self-harm behavior (*N* with Severe cases).

[b] The frequency that student participants reported engaging in the various methods of self-harm.

Table 3

Fit Indices from Confirmatory Factor Analyses of a 4-Factor Measure of Psychological Distress with the Whole Sample (N = 176) and Student Sample (N = 116)

Model	$\chi 2$	*df*	*p*	CFI	RMSEA	SRMR
Whole sample						
Uncorrelated factors	785.70	209	< .001	0.73	0.13	0.34
Correlated factors	436.03	203	< .001	0.89	0.08	0.07
Difference	346.70	6	< .001			
Student sample						
Uncorrelated factors	620.58	209	< .001	0.72	0.13	0.35
Correlated factors	386.58	203	< .001	0.88	0.09	0.08
Difference	233.98	6	< .001			

Note: CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual.

Table 4

Standardized Regression Weights (and Structure Coefficients) from a Confirmatory Factor Analysis of the Correlated Model of Psychological Distress for the Whole Sample

	Factor			
Item	Depression	Anxiety	Obsessive-Compulsion	Interpersonal Sensitivity
Q9	.63 (.63)	- (.41)	- (.45)	- (.52)
Q16	.79 (.79)	- (.51)	- (.56)	- (.65)
Q17	.79 (.79)	- (.51)	- (.56)	- (.65)
Q18	.74 (.74)	- (.48)	- (.53)	- (.61)
Q35	.79 (.79)	- (.51)	- (.57)	- (.65)
Q50	.85 (.85)	- (.55)	- (.61)	- (.70)
Q1	- (.42)	.66 (.66)	- (.50)	- (.47)
Q12	- (.54)	.84 (.84)	- (.64)	- (.60)
Q19	- (.52)	.80 (.80)	- (.61)	- (.58)
Q38	- (.41)	.64 (.64)	- (.49)	- (.46)
Q45	- (.49)	.76 (.76)	- (.58)	- (.54)
Q49	- (.39)	.61 (.61)	- (.46)	- (.44)
Q5	- (.43)	- (.46)	.60 (.60)	- (.43)
Q15	- (.50)	- (.53)	.70 (.70)	- (.50)
Q26	- (.48)	- (.48)	.63 (.63)	- (.45)
Q27	- (.46)	- (.49)	.64 (.64)	- (.46)
Q32	- (.50)	- (.54)	.70 (.70)	- (.50)
Q36	- (.58)	- (.62)	.81 (.81)	- (.58)
Q20	- (.52)	- (.46)	- (.45)	.63 (.63)
Q21	- (.67)	- (.61)	- (.61)	.84 (.84)
Q22	- (.60)	- (.52)	- (.52)	.73 (.73)
Q42	- (.60)	- (.53)	- (.53)	.73 (.73)

Table 5

Correlations Between Psychological Factors for the Whole Sample (N = 176) and the Student Sample (N = 116)

	Depression	Anxiety	OC	IS
Depression	-	.61*	.67*	.69*
Anxiety	.61*	-	.68*	.66*
OC	.62*	.71*	-	.63*
IS	.70*	.64*	.62*	-

Note: OC = obsessive-compulsion; IS = interpersonal sensitivity. * $p < .001$. Values for the whole sample are below the diagonal line, and values for the student sample are above the diagonal line.

Table 6

Fit Indices from a Confirmatory Factor Analysis of Five Sources of Positive Social Support with the Whole Sample (N = 176) and Student Sample (N = 116)

Model	$\chi 2$	*df*	*p*	CFI	RMSEA	SRMR
Whole sample: positive						
Uncorrelated factors	433.78	90	< .001	0.75	0.15	0.16
Correlated factors	355.59	88	< .001	0.81	0.13	0.10
Difference	78.19	2	< .001			
Student sample: positive						
Uncorrelated factors	309.75	90	< .001	0.77	0.15	0.17
Correlated factors	247.17	88	< .001	0.83	0.13	0.10
Difference	65.58	2	< .001			

Note: CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual.

Table 7

Standardized Regression Weights (and Structure Coefficients) from a Confirmatory Factor Analysis of the Correlated Model of Positive Social Support for the Whole Sample

	Factor				
Item	Mother	Father	Friend 1	Friend 2	Romantic P.
Mother SSB	.78 (.78)	- (.21)	-	-	-
Mother SSH	.82 (.82)	- (.22)	-	-	-
Mother COMP	.77 (.77)	- (.21)	-	-	-
Father SSB	- (.21)	.76 (.76)	-	-	-
Father SSH	- (.22)	.82 (.82)	-	-	-
Father COMP	- (.22)	.80 (.80)	-	-	-
Friend 1 SSB	-	-	.77 (.77)	- (.51)	-
Friend 1 SSH	-	-	.88 (.88)	- (.58)	-
Friend 1 COMP	-	-	.71 (.71)	- (.47)	-
Friend 2 SSB	-	-	- (.49)	.74 (.74)	-
Friend 2 SSH	-	-	- (.60)	.91 (.91)	-
Friend 2 COMP	-	-	- (.48)	.73 (.73)	-
Romantic P. SSB	-	-	-	-	.84 (.84)
Romantic P. SSH	-	-	-	-	.85 (.85)
Romantic P. COMP	-	-	-	-	.73 (.73)

Note: SSB = seeks secure base; SSH = seeks safe haven; COMP = companionship; Romantic P. = romantic partner.

Table 8

Bivariate Correlations Between Social Factors for the Whole Sample (N = 176) and the Student Sample (N = 116)

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Mother Pos.	-	.23*	.03	.07	-.08	-.27**	-.04	.01	.03	.03
2. Father Pos.	.24**	-	.21*	.28**	-.17	-.02	-.17	.22*	-.02	.11
3. Friend 1 Pos.	.07	.18*	-	.61***	-.09	.20*	-.06	.11	.08	.01
4. Friend 2 Pos.	.10	.28***	.55***	-	-.01	.27**	.03	.23*	.08	.04
5. RP Pos.	.02	.09	-.05	-.02	-	-.02	-.04	-.03	.08	-.02
6. Mother Neg.	-.29***	-.03	.16*	.19*	.02	-	.13	.06	< .01	.13
7. Father Neg.	.02	-.07	.02	.14	.07	.14	-	.02	.05	.02
8. Friend 1 Neg.	< .01	.19*	.13	.27***	.03	.10	.08	-	.44***	.21*
9. Friend 2 Neg.	.10	.03	.12	.16*	-.14	.06	.14	.37***	-	.10
10. RP Neg.	< .01	< .01	.01	-.05	-.16*	.09	-.06	.20**	.15	-

Note: Pos. = positive support; Neg. = negative interactions; RP = romantic partner. * $p < .05$; ** $p < .01$; *** $p < .001$. Values for the whole sample are below the diagonal line, and values for the student sample are above the diagonal line.

Table 9

Fit Indices from a Confirmatory Factor Analysis of Five Sources of Negative Interactions with the Whole Sample (N = 176) and Student Sample (N = 116)

Model	$\chi 2$	*df*	*p*	CFI	RMSEA	SRMR
Whole sample						
Uncorrelated factors	294.01	90	< .001	0.91	0.11	0.13
Correlated factors	268.31	88	< .001	0.92	0.11	0.10
Difference	25.70	2	< .001			
Student sample						
Uncorrelated factors	263.26	90	< .001	0.88	0.13	0.13
Correlated factors	240.56	88	< .001	0.90	0.12	0.09
Difference	22.70	2	< .001			

Note: CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual.

Table 10

Standardized Regression Weights (and Structure Coefficients) from a Confirmatory Factor Analysis of the Correlated Model of Negative Interactions for the Whole Sample

	Factor				
Item	Mother	Father	Friend 1	Friend 2	Romantic P.
Mother CON	.94 (.94)	-	-	-	-
Mother ANT	.96 (.96)	-	-	-	-
Mother CRI	.89 (.89)	-	-	-	-
Father CON	-	.93 (.93)	-	-	-
Father ANT	-	.84 (.84)	-	-	-
Father CRI	-	.89 (.89)	-	-	-
Friend 1 CON	-	-	.91 (.91)	- (.34)	-
Friend 1 ANT	-	-	.90 (.90)	- (.34)	-
Friend 1 CRI	-	-	.86 (.86)	- (.32)	-
Friend 2 CON	-	-	- (.31)	.82 (.82)	-
Friend 2 ANT	-	-	- (.35)	.93 (.93)	-
Friend 2 CRI	-	-	- (.29)	.76 (.76)	-
Romantic P. CON	-	-	-	-	.96 (.96)
Romantic P. ANT	-	-	-	-	.94 (.94)
Romantic P. CRI	-	-	-	-	.92 (.92)

Note: CON = conflict; ANT = antagonism; CRI = criticism; Romantic P. = romantic partner.

Table 11

Means (with Standard Deviations) and Difference Scores for All Predictors in the BPD-Tx Sample (N = 60) and Student Sample (N = 116)

Variable	BPD-Tx sample	Student sample	*t*(*df*)	*p*
Average psychological distress	2.21 (*0.78*)	2.78 (*0.89*)	*t*(174) = -4.16	< **.001**
Depression	2.45 (*0.92*)	2.85 (*1.12*)	*t*(141.20) = -2.54	**.012**
Anxiety	1.77 (*1.02*)	2.51 (*0.94*)	*t*(174) = -4.81	< **.001**
Obsessive-compulsion	2.26 (*0.88*)	2.89 (*0.96*)	*t*(174) = -4.25	< **.001**
Interpersonal sensitivity	2.48 (*1.00*)	2.93 (*1.14*)	*t*(174) = -2.59	**.010**
Average positive social support	2.85 (*0.48*)	3.07 (*0.60*)	*t*(174) = -2.42	**.017**
Mother positive support	2.72 (*0.91*)	2.90 (*1.07*)	*t*(174) = -1.09	.287
Friend positive support	3.29 (*0.87*)	3.23 (*0.97*)	*t*(174) = 0.44	.659
Romantic P. positive support†	3.55 (*1.18*)	4.28 (*0.73*)	*t*(55.86) = -3.53	**.001**
Average negative social interactions	1.98 (*0.53*)	1.85 (*0.46*)	*t*(174) = 1.69	.093
Mother negative interactions	2.67 (*1.06*)	2.27 (*1.10*)	*t*(174) = 2.32	**.021**
Friend negative interactions*	0.30 (*0.33*)	0.37 (*0.37*)	*t*(174) = -1.19	.235
Romantic P. negative interactions†	2.24 (*1.23*)	1.82 (*0.92*)	*t*(63.09) = 1.88	.064

Note. * variables were transformed with a natural log to address skewness. † For BPD-Tx, $N = 40$; for student sample, $N = 73$. Significant *p* values are in bold.

Table 12

Bivariate Correlations Between all Predictor Variables and Deliberate Self-Harm (DSH) with Various Intent for Each Sample

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.
1. Total DSH	-	.79***	.52***	.52***	.10	.10	.09	.04	.11	-.14	-.15	-.11	-.08	.01	.05	-.14	-.06
2. Non. DSH	.71***	-	.28**	.37***	.06	.08	.09	.00	.04	-.18	-.10	-.17	-.12	-.01	-.01	-.10	.06
3. Amb. DSH	.72***	.25	-	.56***	.28**	.27**	.19*	.19*	.32***	-.16	-.11	-.11	-.08	.08	.11	-.06	-.19
4. Suic. DSH	.38**	-.02	.53***	-	.32***	.33***	.28**	.21*	.29**	-.04	-.05	-.05	-.06	.18	.11	.01	.03
5. Avg. psych	.37**	.20	.28*	.28*	-	.88***	.85***	.87***	.85***	-.01	-.05	-.04	.20	.34***	.23*	.16	-.02
6. Depression	.40**	.24	.27*	.13	.81***	-	.61***	.67***	.69***	-.12	-.15	-.08	.08	.31**	.21*	.10	-.01
7. Anxiety	.45***	.29*	.36**	.41**	.86***	.56***	-	.68***	.66***	.04	.00	.02	.23	.25**	.20*	.10	.01
8. OC	.11	-.04	.17	.22	.80***	.44**	.67***	-	.63***	.07	.03	-.03	.16	.30**	.16	.19*	-.02
9. IS	.21	.15	.05	.08	.80***	.69***	.54***	.51***	-	-.01	-.01	-.04	.26*	.33***	.24*	.15	-.05
10. Avg. pos.	.05	.16	-.04	-.15	.15	.18	.15	.01	.13	-	.52***	.67***	.44***	.09	.10	.18	.10
11. Mo. pos.	-.10	.07	-.17	-.21	.08	.14	.00	.02	.12	.58***	-	.03	.10	-.20*	-.31**	-.02	-.04
12. Fr. pos.	.07	.11	.00	-.16	.05	.12	.03	-.03	.04	.57***	.18	-	.13	.13	.23*	.09	.04
13. RP pos.	-.13	-.16	.10	.28	.07	-.10	.12	.14	.06	.19	-.16	-.33*	-	.04	.07	.00	.08
14. Avg. neg.	.07	.03	.02	.06	.39**	.21	.38**	.34**	.38**	.23	-.05	.19	-.04	-	.65***	.55***	.53***
15. Mo. neg.	.09	-.10	.07	.19	.26*	.09	.32**	.23	.19	.10	-.37**	.06	.24	.62***	-	.10	.13
16. Fr. neg.	.09	.17	-.09	-.08	.24	.24	.25	.09	.22	.23	-.06	.21	-.05	.65***	.37**	-	.26*
17. RP neg.	-.07	.13	-.25	-.19	.31	.31	.18	.10	.46**	-.24	-.05	.01	-.17	.53***	-.05	.35*	-

Note: Non = nonsuicidal; Amb = ambivalent; Suic = suicidal; Avg. = average; psych = psychological distress; OC = obsessive-compulsion; IS = interpersonal sensitivity; pos. = positive support; Mo. = mother; Fr. = friend; RP = romantic partner; neg. = negative interactions. * $p < .05$; ** $p < .01$; *** $p < .001$. Values for the BPD-Tx sample ($N = 60$; N with romantic partner = 40) are below the diagonal line, and values for the student sample ($N = 116$; N with romantic partner = 73) are above the diagonal line.

Table 13

Hierarchical Multiple Regression Analyses Predicting Total Self-Harm for Model 1 (BPD-Tx Sample) and Model 2 (Student Sample)

	BPD-Tx Sample (N = 60)			Student Sample (N = 116)		
Variable	*B*	*SE B*	β	*B*	*SE B*	β
Block 1						
Depression	0.68	0.32	.34*	0.12	0.18	.09
Anxiety	1.02	0.30	.57**	0.09	0.22	.06
Obsessive-compulsion	-0.68	0.32	-.33*	-0.17	0.22	-.12
Interpersonal sensitivity	-0.31	0.30	-.17	0.11	0.18	.08
Block 2						
Depression	0.69	0.33	.34*	0.06	0.19	.05
Anxiety	1.06	0.31	.59**	0.10	0.22	.07
Obsessive-compulsion	-0.70	0.33	-.34*	-0.12	0.22	-.08
Interpersonal sensitivity	-0.28	0.31	-.15	0.11	0.18	.09
Average positive support	-0.27	0.46	-.07	-0.32	0.23	-.13
Average negative interactions	-0.14	0.45	-.04	-0.04	0.31	-.01

Note: RP = romantic partner. * $p < .05$; ** $p < .01$.

Table 14

Hierarchical Multiple Regression Analyses Predicting Total Self-Harm Using Averaged Psychological Distress (N = 176)

Variable	Block 1			Block 2		
	B	*SE B*	β	*B*	*SE B*	β
Model 3						
Sample (BPD-Tx = 1, student = -1)	0.61	0.13	.35***	0.68	0.13	.39***
Avg. psychological distress	0.36	0.14	.19*	0.51	0.15	.28**
Interaction	-	-	-	0.35	0.15	.18*
Model 4						
Sample (BPD-Tx = 1, student = 0)	1.22	0.26	.35***	1.36	0.26	.39***
Avg. psychological distress	0.36	0.14	.19*	0.16	0.16	.09
Interaction	-	-	-	0.71	0.30	.21*

Note: Avg. = average. * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 15

Hierarchical Multiple Regression Analyses Predicting Total Self-Harm Using Individual Psychological Variables (N = 176)

	Block 1			Block 2		
Variable	*B*	*SE B*	β	*B*	*SE B*	β
Model 5						
Sample (BPD-Tx = 1, student = -1)	0.61	0.13	.35***	0.67	0.13	.38***
Depression	0.28	0.16	.18	0.40	0.18	.26*
Anxiety	0.50	0.18	.31**	0.55	0.18	.34**
Obsessive-compulsion	-0.40	0.18	-.24*	-0.43	0.19	-.25*
Interpersonal sensitivity	-0.05	0.16	-.03	-0.10	0.17	-.07
Interaction: depression	-	-	-	0.28	0.18	.18
Interaction: anxiety	-	-	-	0.47	0.18	.27*
Interaction: OC	-	-	-	-0.25	0.19	-.14
Interaction: IS	-	-	-	-0.21	0.17	-.14
Model 6						
Sample (BPD-Tx = 1, student = 0)	1.30	0.26	.38***	1.44	0.26	.42***
Anxiety	0.39	0.12	.24**	0.14	0.15	.08
Interaction: anxiety	-	-	-	0.67	0.24	.26**

Note: OC = obsessive-compulsion; IS = interpersonal sensitivity. * $p < .05$; ** $p < .01$; *** $p <$ 001.

Table 16

Hierarchical Multiple Regression Analysis Predicting Total Self-Harm Using the Averaged Social Variables (N = 176)

Variable	Block 1			Block 2		
	B	*SE B*	β	*B*	*SE B*	β
Model 7						
Sample (BPD-Tx = 1, student = -1)	0.47	0.13	.27***	0.49	0.13	.29***
Average positive support	-0.23	0.22	-.08	-0.11	0.25	-.04
Average negative interactions	0.15	0.25	.04	0.14	0.26	.04
Interaction: positive	-	-	-	0.24	0.25	.08
Interaction: negative	-	-	-	0.07	0.26	.02

Note: *** $p < .001$.

Table 17

Hierarchical Multiple Regression Analyses Predicting Total Self-Harm Using Individual Positive Social Variables With and Without Romantic Partner Support

	Block 1			Block 2		
Variable	*B*	*SE B*	β	*B*	*SE B*	β
Model 8 (*N* = 176)						
Sample (BPD-Tx = 1, student = -1)	0.49	0.13	.28***	0.49	0.13	.28***
Mother positive	-0.20	0.12	-.12	-0.22	0.13	-.14
Friend positive	-0.06	0.13	-.03	0.02	0.14	.01
Interaction: mother positive	-	-	-	-0.02	0.13	-.02
Interaction: friend positive	-	-	-	0.18	0.14	.10
Model 8 (*N* = 113)						
Sample (BPD-Tx = 1, student = -1)	0.35	0.16	.22*	0.36	0.16	.23*
Mother positive	-0.10	0.14	-.06	-0.15	0.16	-.10
Friend positive	-0.10	0.16	-.06	-0.05	0.17	-.03
RP positive	-0.17	0.15	-.11	-0.15	0.16	-.10
Interaction: mother positive	-	-	-	-0.09	0.16	-.06
Interaction: friend positive	-	-	-	0.13	0.17	.08
Interaction: RP positive	-	-	-	-0.04	0.16	-.02

Note: Positive = positive support; negative = negative interactions; RP = romantic partner. * $p < .05$; *** $p < .001$.

Table 18

Hierarchical Multiple Regression Analyses Predicting Total Self-Harm Using Individual Negative Social Variables With and Without Romantic Partner

	Block 1			Block 2		
Variable	*B*	*SE B*	β	*B*	*SE B*	β
Model 9 (*N* = 176)						
Sample (BPD-Tx = 1, student = -1)	0.47	0.13	.27***	0.49	0.13	.28***
Mother negative	0.11	0.12	.07	0.10	0.13	.06
Friend negative	-0.31	0.34	-.07	-0.10	0.39	-.02
Interaction: mother negative	-	-	-	0.01	0.13	.01
Interaction: friend negative	-	-	-	0.47	0.39	.10
Model 9 (*N* = 113)						
Sample (BPD-Tx = 1, student = -1)	0.40	0.15	.285*	0.38	0.16	.25*
Mother negative	0.12	0.13	.09	0.14	0.14	.10
Friend negative	-0.32	0.43	-.07	-0.28	0.49	-.06
RP negative	-0.06	0.14	-.05	-0.06	0.14	-.04
Interaction: mother negative	-	-	-	0.12	0.14	.09
Interaction: friend negative	-	-	-	0.30	0.49	.07
Interaction: RP negative	-	-	-	-0.03	0.14	-.02

Note: Positive = positive support; negative = negative interactions; RP = romantic partner. * $p < .05$; ** $p < .01$; *** $p < .001$.

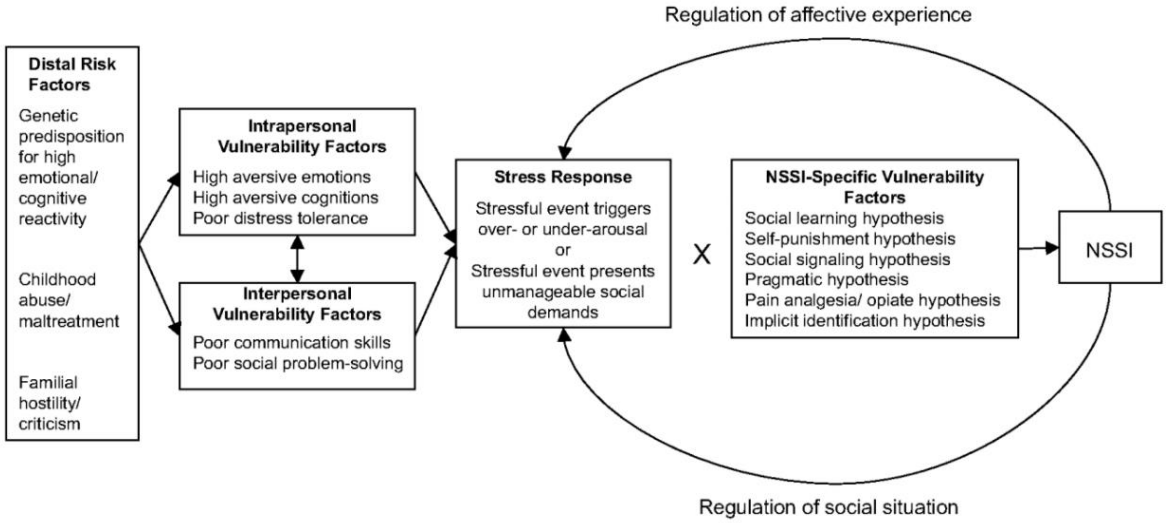

Figure 1. The Integrated Theoretical Model of self-harm. From "Why do People Hurt Themselves? New Insights into the Nature and Function of Self-Injury" by M. K. Nock, 2009, *Current Directions in Psychological Science, 18,* p. 79. Copyright 2009 by SAGE Publications. Reprinted with permission for Master's thesis.

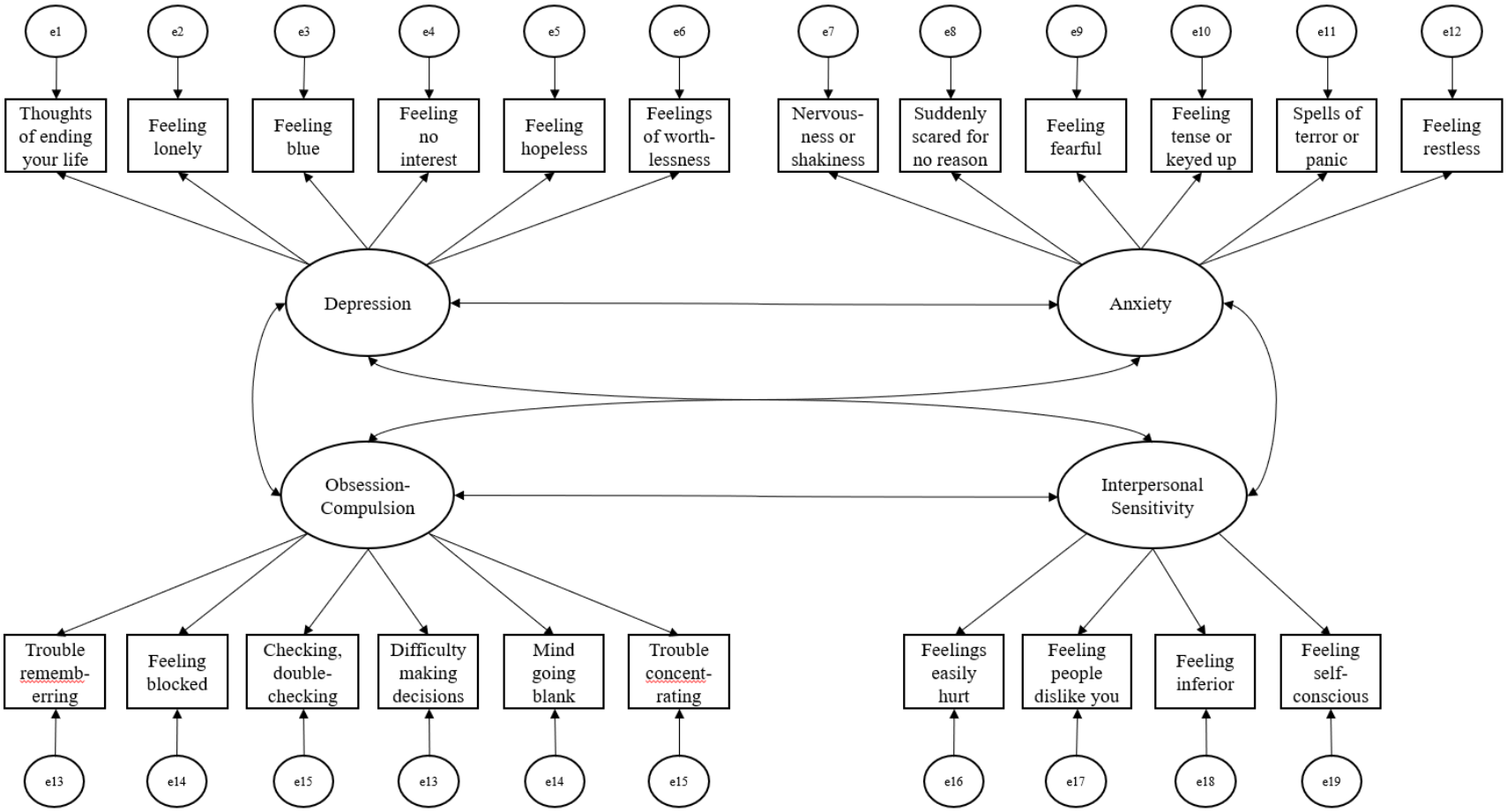

Figure 2. The correlated model showing the four latent variables of psychological distress using the BSI.

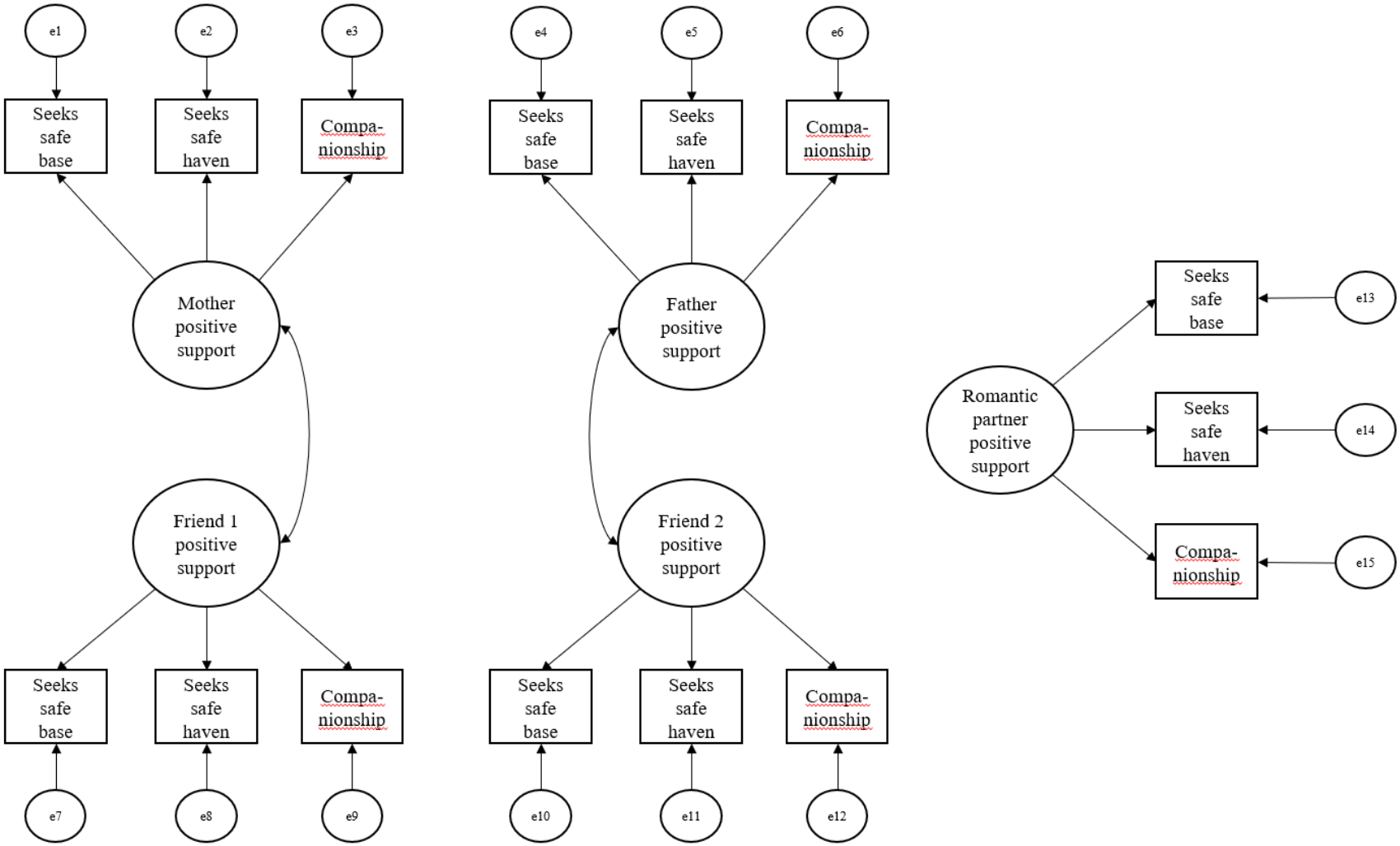

Figure 3. The correlated model showing the sources of positive social support using composite variables from the NRI.

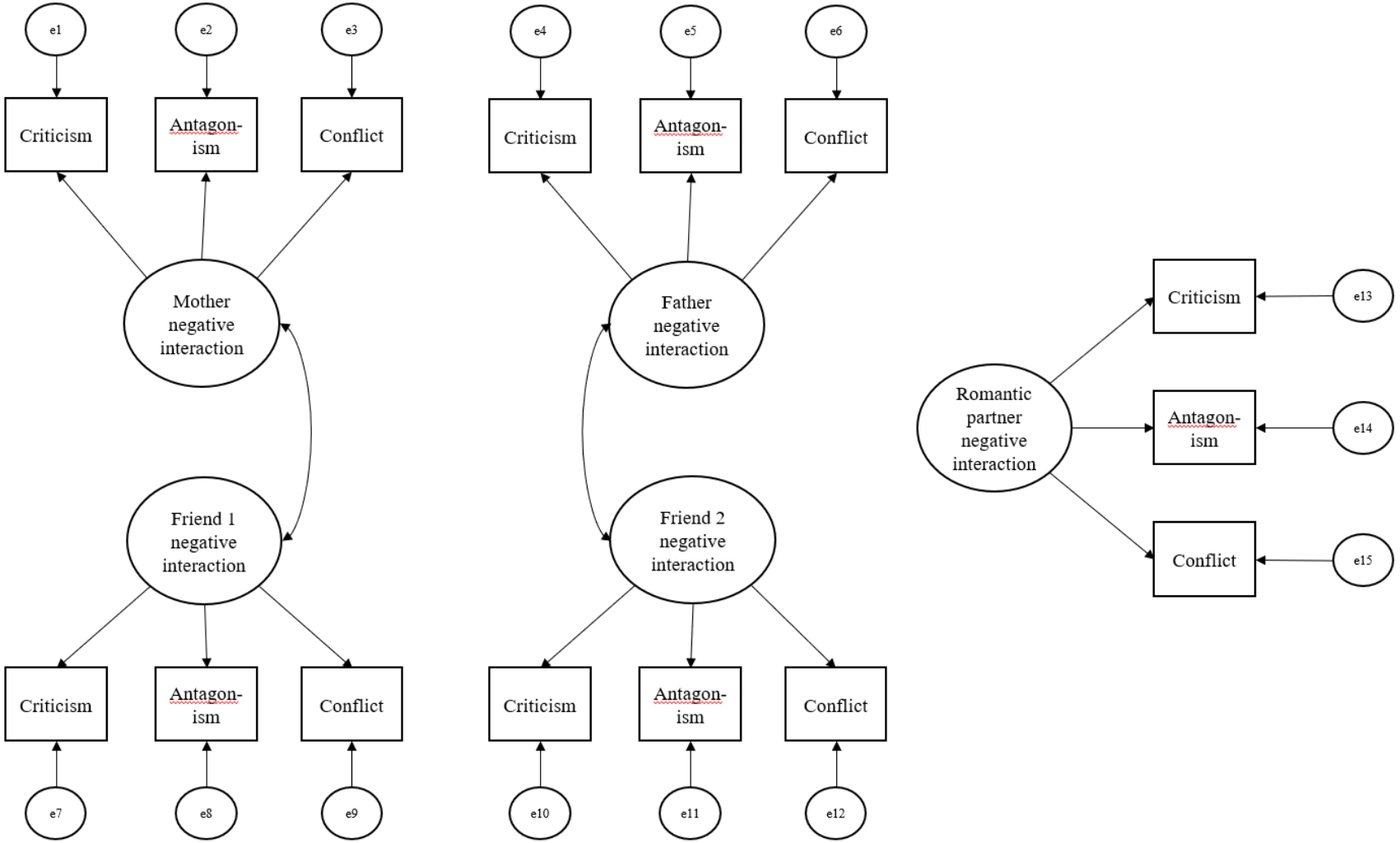

Figure 4. The correlated model showing the sources of negative interactions using composite variables from the NRI.

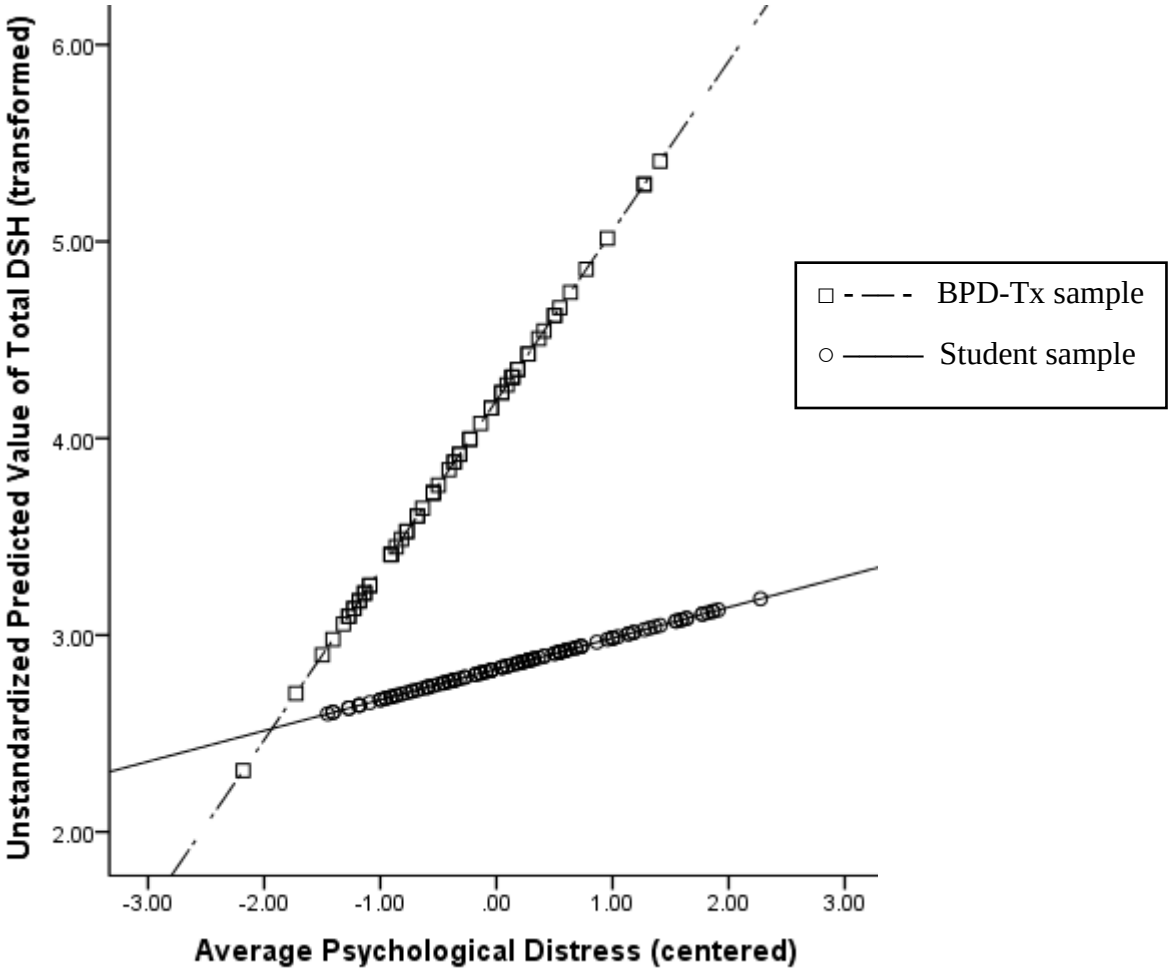

Figure 5. The regression line of average psychological distress predicting total DSH for each sample.

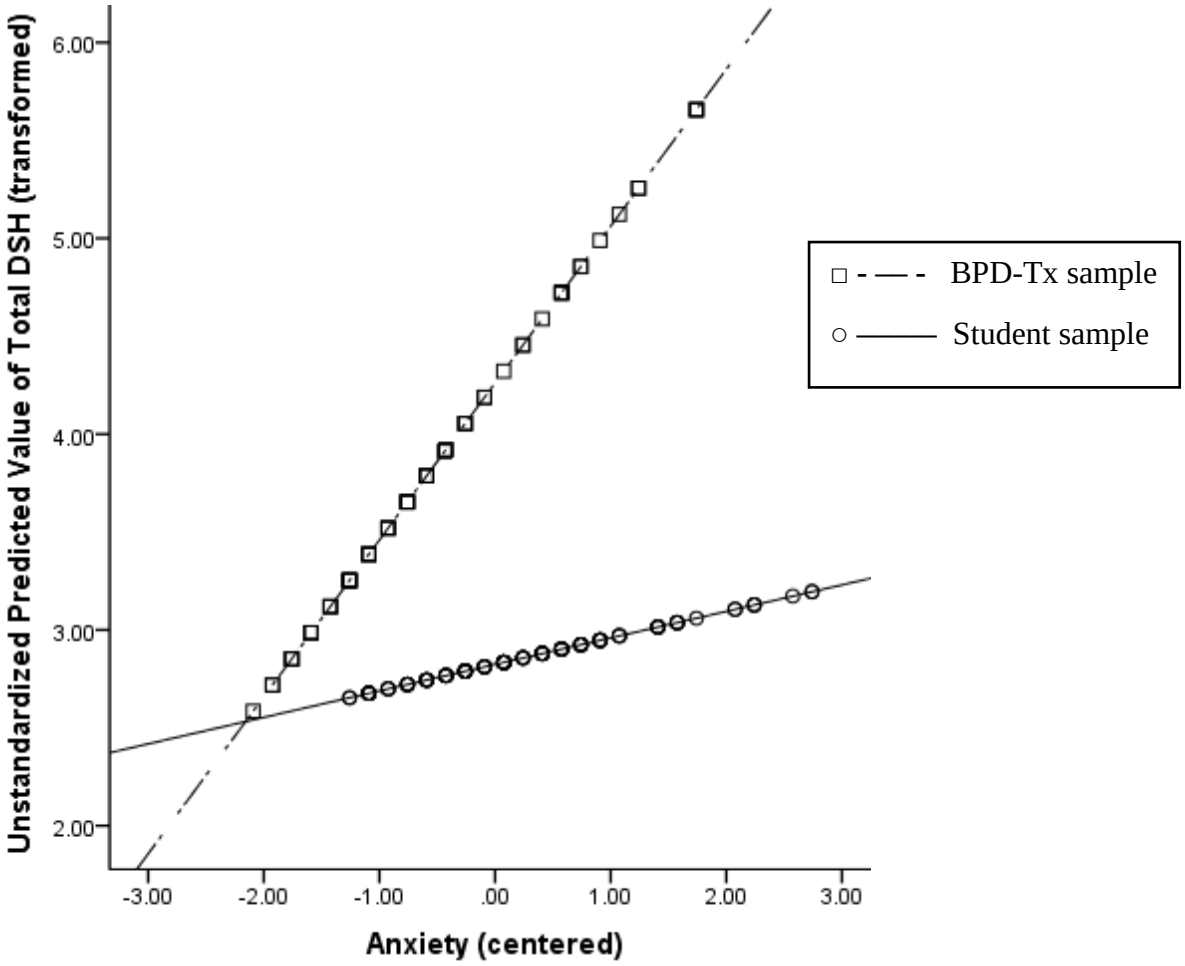

Figure 6. The regression line of anxiety predicting total DSH for each sample.