DSM-5 PTSD and Passive Suicidal Ideation: An Application of the Interpersonal-Psychological Theory of Suicide

by

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Abstract

The relationship between posttraumatic stress disorder (PTSD) and passive suicidal ideation (passive SI) is well established, but the underlying mechanisms have not been sufficiently explicated (Panagioti, Gooding, & Tarrier, 2012). Two recent studies (Davis, Witte, & Weathers, 2014; Davis, Witte, Weathers, & Blevins, 2014) sought to enhance understanding of the PTSD/ passive SI relationship using the interpersonal-psychological theory of suicide (IPTS; Joiner, 2005) as a conceptual framework. Both found evidence of a relationship between emotional numbing symptoms and passive SI. Since the completion of these studies, *DSM-5* introduced substantial changes to the diagnostic criteria for PTSD, including combining emotional numbing symptoms with new symptoms to form a cluster labeled negative alterations in cognitions and mood (NACM; Freidman, Resick, Bryant, & Brewin, 2011). The current study is a replication and extension of Davis et al. (2014), designed to examine how *DSM-5* changes to the PTSD diagnostic criteria affect understanding of the PTSD/passive SI relationship. Participants were trauma-exposed undergraduates (N = 380). PTSD was specified as having six factors, following the anhedonia model (Liu et al., 2014), which splits *DSM-5* NACM (Cluster D) into NACM (D1-D4) and anhedonia (D5-D7). As hypothesized, of the six PTSD clusters anhedonia had the strongest bivariate relationship with perceived burdensomeness. However, PTSD clusters were not differentially related to thwarted belongingness or passive SI. In structural models, no PTSD cluster was directly related to passive SI; rather, each cluster was indirectly related to passive SI through perceived burdensomeness. Further, in all structural

models, perceived burdensomeness was the only variable with a direct relationship with passive SI. Taken together, these findings do not support the idea that PTSD symptom clusters are differentially related to passive SI. However, they do implicate perceived burdensomeness as playing an important role in the PTSD/passive SI relationship.

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Introduction

The relationship between posttraumatic stress disorder (PTSD) and various forms of suicidal behavior has been the subject of increased media and research attention in recent years (Panagioti, Gooding, & Tarrier, 2012). Recognition of the correspondingly higher rates of PTSD and suicidal behavior in combat veterans compared to the general public (Schoenbaum et al., 2014) has led to increased speculation concerning the significance of their relationship. Given the potentially damaging effects of both PTSD and suicidal behavior individually, their co-occurrence is a significant public health concern (Knox, 2008).

Despite media focus on veterans, research has confirmed the existence of a positive relationship between PTSD and all forms of suicidal behavior across populations (e.g., gender, trauma type; Panagioti et al., 2012). This relationship has been reported in large-scale epidemiological studies (Conner et al., 2014; Nock et al., 2009), and has proven consistent in recent meta-analyses even when controlling for age, gender, trauma type, comorbid mental health conditions, and other potentially relevant correlates such as depressive symptoms (Panagioti, Gooding, Triantafyllou, & Tarrier, 2014; Panagioti, et al., 2012; Krysinska & Lester, 2010). These findings, however, all refer to the relationship with PTSD as defined in the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-IV*; American Psychiatric Association, 1994) which is now obsolete. Some of the specific changes to the PTSD criteria for *DSM-5* (American Psychiatric Association, 2013) necessitate replication of these studies to establish how suicidal behavior and suicidal ideation (SI) relate to PTSD as currently defined.

Although the majority of research concerning the link between PTSD and suicidal behavior is descriptive (Panagioti, Gooding, Dunn & Tarrier, 2011), recent studies have moved beyond simply establishing the strength and consistency of the relationship and have begun elucidating the underlying mechanisms. There are at least two important ways in which recent research has advanced understanding of the PTSD/suicidal behavior relationship. First, some recent studies have made explicit reference to conceptual models of suicide — especially the interpersonal-psychological theory of suicide (IPTS; Joiner 2005) — in formulating hypotheses about how suicidal behavior develops among those with PTSD. This is essential because understanding the development of suicidal behavior requires a conceptual model capable of explaining how and why such behaviors occur—what causes a person to end his/her own life or to desire death (Panagioti et al., 2012). Second, recent studies have examined relationships between specific PTSD symptom clusters and suicidal behavior. This is essential because various PTSD symptom clusters have differential relationships with associated variables such as depression and physiological arousal (Asmundson, Stapelton, & Taylor, 2004); thus, examining relationships between specific PTSD clusters and suicidal behavior may reveal meaningful relationships with specific clusters that are obscured when PTSD is examined at the syndrome level. The specifics and advantages of these two advances in PTSD/suicidal behavior research methodology are expounded upon below.

Regarding the first advance, for years a widely accepted and empirically testable model accounting for suicidal behavior was not available (Panagioti et al., 2012). In 2005, Thomas Joiner introduced such a model, the IPTS (Joiner, 2005). The IPTS is a comprehensive, empirically grounded model with considerable heuristic value for explaining various forms of suicidal behavior. It postulates that three constructs independently or in combination serve as

proximal causes for all forms of suicidal behavior. The first two IPTS constructs, perceived burdensomeness and thwarted belongingness, are proposed as sufficient, proximal causes of SI. Perceived burdensomeness is defined as the sense that one is a burden to others and that others would be better off in one's absence. Possible contributors to the development of perceived burdensomeness include functional impairment and unemployment (Inoue et al., 2007; Kaplan, McFarland, Huguet & Newsom, 2007). Thwarted belongingness is defined as the sense that one lacks meaningful social connections (Baumeister & Leary, 1995). The IPTS holds that perceived burdensomeness and thwarted belongingness are distinct but related constructs, each of which serves as a proximal cause for the development of passive SI (i.e., thoughts of suicide without intent) when present in isolation. The simultaneous presence of perceived burdensomeness, thwarted belongingness, and hopelessness serves as the proximal cause for suicidal desire, or active SI. Finally, the model postulates that progression from suicidal thought to action (attempted death by suicide) requires the presence of a third construct, acquired capability of suicide, which involves both habituation to physical pain and relative fearlessness about death (Van Orden, Cukrowicz, Witte, & Joiner, 2012).

The IPTS has a number of advantages relative to other models seeking to explain suicidal behavior. First, the IPTS is comprehensive. It provides definitions of the constructs proposed as proximal causes for various forms of suicidal behavior, as well as detailed description and justification of hypotheses concerning the specific pathways between those constructs and relevant forms of suicidal behavior. Second, the IPTS proposes distinct constructs as proximal causes for specific forms of suicidal behavior, which allows it to account for the fact that different forms of suicidal behavior can occur in isolation (e.g., one can think about suicide without actually attempting it). Third, the hypothesized rarity, or rarity in combination, of IPTS

constructs, corresponds with the observed frequency of the behaviors they predict (Van Orden et al., 2012). For example, SI is more common than other forms of suicidal behavior (CDC, 2011). Similarly, the IPTS constructs corresponding with SI (perceived burdensomeness and thwarted belongingness) are more prevalent than those relating to other forms of suicidal behavior (i.e., acquired capability for suicide; Van Orden et al., 2012). According to the Centers for Disease Control (2010), roughly 5.60 % of the population reported experiencing SI between 2009 and 2010, while only 0.70 % reported attempting suicide. Suicidal behaviors occur at different rates, suggesting they have different underlying causes and likely different correlates. Thus, considering different forms of suicidal behavior separately provides meaningful information concerning potential differential relationships with variables like PTSD, and failure to do so may obscure potentially meaningful information.

Regarding the second advance in the PTSD/suicidal behavior literature, the trauma literature has established that PTSD is a heterogeneous disorder involving multiple independent but intercorrelated clusters of symptoms (Elhai & Palmieri, 2011). More specifically, *DSM-IV* diagnostic criteria for PTSD described three symptom clusters: reexperiencing (i.e., persistent and distressing reexperiencing of the traumatic event), emotional numbing/avoidance (i.e., symptoms involving numbing of general emotional responsiveness and symptoms involving persistent avoidance of trauma-relevant stimuli, respectively), and hyperarousal (i.e., persistent symptoms of increased physiological arousal). However, the majority of studies have found that emotional numbing and avoidance symptoms actually represent two distinct clusters (Elhai & Palmieri, 2011), so they were separated into different clusters in *DSM-5*. Despite the fact that different PTSD clusters have demonstrated differential relationships with a variety of variables (Asmundson et al., 2004), few studies involving PTSD and suicidal behavior have considered the

clusters separately. Until recently, most studies focused on PTSD and suicidal behavior have considered PTSD at the syndrome level, summing symptoms across clusters to create a total severity score. Examining the relationship between specific PTSD clusters and suicidal behavior would facilitate consideration of potentially important differences in how individual clusters relate to various forms of suicidal behavior. While a number of studies have now examined the relationship between PTSD and suicidal behavior at the cluster level, results are inconsistent (e.g., Bell & Nye, 2007; Guerra & Calhoun, 2011). Some researchers have speculated that use of different models of PTSD symptom structure across studies may have contributed to inconsistent findings. For example, some studies used the *DSM-IV* three-factor model (e.g., Bell & Nye, 2007), which combines avoidance and emotional numbing symptoms, whereas others treated avoidance and emotional numbing symptoms as separate clusters (e.g., Guerra & Calhoun, 2011).

In the past few years, a number of studies have examined the PTSD/suicidal behavior relationship using the IPTS framework. However, most are limited by one of the methodological or conceptual issues discussed above. Specifically, most studies referencing the IPTS to examine the PTSD/suicidal behavior relationship either examined the relationship between IPTS constructs and a variable which combined multiple forms of suicidal behavior (e.g., Bryan & Anestis, 2011), or failed to consider the relationship between individual PTSD clusters and suicidal behavior (e.g., Bryan, Hernandez, Allison, & Clemans, 2013). Thus, while several studies have confirmed the utility of IPTS constructs in predicting suicidal behavior among those with PTSD (e.g., Bryan, Cukrowicz, West, & Morrow, 2010) and even demonstrated relationships between PTSD symptom severity and IPTS constructs (e.g., Bryan et al., 2013),

most did not test potentially more informative symptom- or cluster-level hypotheses. There are, however, three recent exceptions.

Since 2013, three published studies have used the IPTS to examine the relationship between specific PTSD symptoms or symptom clusters and SI specifically. First, Monteith et al. (2013) examined the relationships between IPTS constructs, PTSD symptom clusters, and SI. Although they confirmed the IPTS predictions that perceived burdensomeness and thwarted belongingness would predict SI, they found that none of the individual PTSD symptom clusters did. Several potential methodological choices may have affected the findings of Monteith and colleagues (2013). For example, Monteith et al. (2013) used the three-factor model of PTSD symptom structure, which has minimal empirical support (Elhai & Palmieri, 2011). Additionally, they did not differentiate between passive and active SI, which the IPTS proposes have distinct proximal causes.

The second and third studies, completed by Davis and colleagues, examined the relationship between PTSD and SI first at the symptom level (Davis, Witte, & Weathers, 2014) and then at the cluster level (Davis et al., 2014) with guidance from the IPTS. The purpose of Davis, Witte, & Weathers (2014) was to evaluate hypotheses based on the IPTS suggesting that specific individual PTSD symptoms might account for more of the variance in SI (including both passive and active SI as in Monteith et al., 2013) than others. Examination of symptom content suggested that some of the emotional numbing symptoms were more theoretically consistent with SI-relevant IPTS constructs (perceived burdensomeness and thwarted belongingness) and might therefore be uniquely related to SI. For example, thwarted belongingness and the associated perceived lack of social support (Van Orden et al., 2012) seems theoretically consistent with the emotional numbing symptom of detachment or estrangement from others. It

was therefore hypothesized that emotional numbing symptoms—and detachment/estrangement in particular—would emerge as the strongest predictors of SI in a regression framework with all other PTSD symptoms controlled for. As hypothesized, detachment/estrangement had a stronger association with SI than any other PTSD symptom. Further, two emotional numbing symptoms—detachment/estrangement and a sense of foreshortened future— were the only PTSD symptoms with a positive association with SI after controlling for depressive symptoms, response bias, and all other PTSD symptoms (Davis, Witte, & Weathers, 2014).

Similar to Monteith et al. (2013), the third study (Davis et al., 2014) examined the relationship between PTSD symptom clusters and SI—again hypothesizing a unique relationship between emotional numbing and SI relative to other symptom clusters. However, several methodological differences were implemented. First, rather than relying on the *DSM-IV* three-cluster model or selecting an alternative model of PTSD symptom structure a priori, Davis et al (2014) evaluated the *DSM-IV* model and three empirically supported models of PTSD symptom structure and compared model fit using chi-square difference testing. The five-factor dysphoric arousal model (Elhai et al., 2011), which separates avoidance and emotional numbing symptoms and divides hyperarousal symptoms into dysphoric and anxious arousal, showed the best fit and was used in all structural analyses. This choice was important because it allowed for re-examination of hypotheses formulated and tested in the symptom-focused study concerning the significance of emotional numbing. Use of the *DSM-IV* model as in Monteith et al. (2013) would have required that emotional numbing and avoidance symptoms be combined, potentially obscuring the hypothesized relationships between emotional numbing and SI. In fact, the only two previous studies that both examined the relationship between suicidal behavior and individual PTSD clusters and employed an empirically supported model of symptom structure—

separating avoidance and emotional numbing symptoms—found a unique relationship between emotional numbing and SI (Guerra & Calhoun, 2011; Hellmuth, Stappenbeck, Hoerster & Jakupcak, 2012). Second, unlike Monteith et al. (2013) and Davis, Witte, and Weathers (2014), Davis et al. (2014) included direct measures of perceived burdensomeness and thwarted belongingness. Use of structural equation modeling and bootstrapping facilitated evaluation of the potential role of these IPTS constructs as mediators between various PTSD clusters and SI. Third, the focus of Davis et al. (2014) was limited to passive SI, which the IPTS suggests has distinct proximal causes compared to other forms of suicidal behavior.

Thus, Davis et al. (2014) confirmed the hypothesis that emotional numbing would have the strongest relationships with both IPTS constructs and passive SI among PTSD symptom clusters. However, the full structural model containing both IPTS constructs, passive SI, and all five PTSD clusters showed evidence of multicollinearity, suggesting that it was not justifiable to interpret (Cheung & Lau, 2008). To compensate for this, five separate structural models were specified, each containing perceived burdensomeness, thwarted belongingness, passive SI, and a single PTSD symptom cluster. Consistent with IPTS hypotheses, the relationship between each symptom cluster and passive SI was at least partially mediated by one or both IPTS constructs. Further, both emotional numbing and reexperiencing were directly related to passive SI in their respective structural models. These findings demonstrate the utility of the IPTS for facilitating the understanding of the relationship between PTSD and passive SI, and partially support the hypothesized unique relationship between emotional numbing and passive SI. However, they warrant replication and should be interpreted with caution. The inability to test a model with all PTSD clusters together may obscure unique relationships between specific symptom clusters and suicidal behavior.

After the completion of Davis et al. (2014), *DSM-5* was published and the diagnostic criteria for PTSD were substantively revised. Not only were symptoms of avoidance and emotional numbing separated into distinct clusters, in keeping with empirical evidence (e.g., Elhai & Palmieri, 2011), but three new symptoms concerning cognitions and mood were combined with existing emotional numbing symptoms to form the new NACM cluster. It is not yet clear how these changes will affect findings concerning the relationship between specific symptom clusters (e.g., the former emotional numbing cluster) and SI. Of note, several of the new symptoms may increase construct overlap between the new NACM cluster containing emotional numbing symptoms and hypothesized proximal causes of SI, such as the IPTS constructs perceived burdensomeness and thwarted belongingness. For example, in *DSM-5*, guilt (together with other negative trauma related emotions) is now designated as a PTSD symptom and included in the NACM cluster, but guilt is also specified as a facet of perceived burdensomeness by the IPTS (Van Orden et al., 2012). More broadly, the new NACM symptom referring to distorted negative cognitions may bolster the cluster's correlation with perceived burdensomeness and thwarted belongingness—which, at least in some cases, could themselves be described as specific types of distorted negative cognitions These changes to the PTSD diagnostic criteria, therefore, reinforce the need for replication, to substantiate or refute the findings from Davis et al. (2014) and improve understanding of the nature of the relationship between various PTSD symptom clusters and the IPTS constructs specified as proximal causes for suicidal behavior.

Further, as described by Davis et al. (2014), the model used to define PTSD symptom structure affects the outcome of studies concerning the relationship between PTSD and SI. Thus, examination of the relationship between SI and empirically derived PTSD symptom clusters with

verified fit to the data is essential. Since the relatively recent publication of the *DSM-5* (APA, 2013), a number of studies have examined the factor structure of PTSD using the revised symptoms it provides. One such study conducted by Liu and colleagues (2014) demonstrated strong support for an alternative to the four-factor *DSM-5* model, which they labeled the anhedonia model. Their anhedonia model specifies six symptom clusters: re-experiencing, avoidance, NACM (containing only symptoms D1-D4 from the *DSM-5* NACM cluster), anhedonia (containing symptoms D5-D7 symptoms from the *DSM-5* NACM cluster), anxious arousal (containing symptoms E3-E4 from the *DSM-5* hyperarousal cluster), and dysphoric arousal (containing the other four *DSM-5* hyperarousal symptoms). Subdivision of the hyperarousal cluster into anxious and dysphoric arousal symptoms was first proposed and supported by Elhai and colleagues (2011) in their five-factor model of *DSM-IV* symptoms, a model which provided the best fit to the data in Davis et al. (2014) and was therefore used in all structural analyses. Given such emerging factor analytic evidence challenging the *DSM-5* symptom cluster model, empirical evaluation of *DSM-5* PTSD factor structure is advisable for any study with analyses focusing on PTSD at cluster level.

Building on the work of Davis et al. (2014), the present study tested three hypotheses regarding the relationship between specific *DSM-5* PTSD symptom clusters and passive SI. The choice to focus exclusively on passive SI was based both on the aim to replicate Davis et al. (2014) as exactly as possible and on the express recommendations of the IPTS that individual forms of suicidal behavior be considered separately. First, following Davis et al. (2014), the four-factor *DSM-5* model was tested against a recently proposed, empirically supported six-factor anhedonia model (Liu et al., 2014). Hypothesis 1 was that this six-factor anhedonia model (described further in the *Results* section) would provide superior fit to the data.

Hypothesis 2 was that, relative to other PTSD symptom clusters, the cluster containing symptoms of emotional numbing (anhedonia, detachment/estrangement, and constricted positive affect, i.e., *DSM-5* symptoms D5-D7) would have the strongest relationship with perceived burdensomeness, thwarted belongingness, and passive SI. Assuming that Hypothesis 1 was supported, the anhedonia cluster—containing the three referenced emotional numbing symptoms (Liu et al., 2014) —was hypothesized to have the strongest relationship with perceived burdensomeness, thwarted belongingness, and passive SI. This hypothesis was based on the findings of the earlier study by Davis, Witte, and Weathers (2014), which showed that these emotional numbing symptoms had higher bivariate relationships with SI than did other individual PTSD symptoms, and that detachment/estrangement was the strongest predictor of SI among PTSD symptoms in regression modeling.

Finally, based on Davis et al. (2014), Hypothesis 3 was that perceived burdensomeness, thwarted belongingness, or both would partially mediate the relationship between the cluster containing emotional numbing symptoms and passive SI, when gender and all other PTSD clusters were controlled for. To test Hypotheses 2 and 3, measurement and structural models were specified to include individual PTSD symptom clusters, gender, perceived burdensomeness, thwarted belongingness, and passive SI.

Method

Participants and Procedure

Participants were undergraduates enrolled in psychology courses at a large public university in the southeastern United States. With the approval of the university's internal review board, participants who self-identified as having experienced a "very stressful life event" were recruited to complete a battery of questionnaires online. Questionnaires were administered in a different random order for each participant. The only exception was the suicide questionnaire, which was always administered last. This enabled participants who reported active SI, as evidenced by a score of 6 or higher on the Beck Suicide Scale (BSS; Beck & Steer, 1991) to receive instructions on creating a coping card before exiting the survey. In addition, at the end of each questionnaire participants were asked to confirm their wish to continue. When data collection was concluded, participants were only included in analyses if their index event met *DSM-5* Criterion A as classified by examination of responses to the Life Events Checklist for *DSM-5* (LEC-5; described below) in conjunction with trauma narratives. The final sample included 380 individuals ranging in age from 17 to 36 (M = 19.99 years, SD = 1.99) and was predominantly female (75.30 % female, n = 289). The ethnic breakdown of the sample was 89.20% Caucasian, 4.20% African-American, 2.90% Latino/Hispanic, 2.90% Asian, and 0.80% other.

Measures

Trauma exposure and PTSD. The LEC-5 was used to assess trauma type and exposure level. The original LEC is the self-report trauma assessment portion of the Clinician-

Administered PTSD Scale (CAPS; Blake et al., 2004; Weathers, Keane, & Davidson, 2001) and assesses exposure to 17 types of traumatic events (e.g., natural disaster, sexual assault). That version of the LEC has been demonstrated to have good psychometric properties (Gray, Litz, Hsu, & Lombardo, 2004). The LEC-5 (Weathers, Blake, Schnurr, Kalopek, Marx, & Keane, 2013) is a revised version of the measure designed to assess the *DSM-5* definition of PTSD Criterion A.

Participant responses to the LEC-5 were examined to determine whether they reported experiencing at least one Criterion A event as defined in *DSM-5*, which specifies exposure to "death, threatened death, actual or threatened serious injury, or actual or threatened sexual violence" under specific circumstances (e.g., the death of a loved one that is learned about, not witnessed only qualifies if it was violent or accidental). As an additional check, I also examined the brief narrative descriptions of the worst traumatic event participants reported experiencing, to verify compliance with Criterion A and correspondence between the event reported on the LEC-5 and the event referenced in participant responses to the PTSD Checklist for *DSM*-5 (PCL-5; Weathers, Litz, Keane, Palmieri, Marx, & Schnurr, 2013). Only participants whose index event was verified as meeting Criterion A after the narrative check were included in analyses (APA, 2013, p. 427).

The PCL-5 was used to measure PTSD symptom severity. The previous version of the measure, the PCL-S, was widely used and well-validated (McDonald & Calhoun, 2010; Wilkins, Lang, & Norman, 2011), and early analyses suggest the *DSM-5* version has similar psychometric properties (Blevins, Weathers, Davis, Witte, & Domino,). Like the previous versions of the measure, the PCL-5 is a self-report instrument that assesses each *DSM* symptom of PTSD—20 in *DSM-5*. Respondents first identified an index stressful life event, then indicated how much they

had been bothered by each PTSD symptom in the past month using a five-point scale (0 = *not at all* to 4 = *extremely*). In the current sample, internal consistency was high (α = .95), mean total score was 15.98 (SD = 15.73), and 34.80% of the sample (n = 132) met criteria for a provisional PTSD diagnosis based on *DSM-5* criteria (i.e., reported experiencing at least one reexperiencing symptom, one avoidance symptom, two NACM symptoms, and two hyperarousal symptoms at least "moderately" in the past 30 days).

Passive SI. The BSS (Beck & Steer, 1991) is a 21-item self-report measure designed to assess the presence and severity of suicidal behavior. All items are presented with variable response options which range in severity on a scale from 0 to 2. The first nineteen items assess SI, planning, and preparation, whereas items 20 and 21 assess history of suicide attempts. Based on items 20 and 21, 5.80% of the sample (*n* = 22) reported one past suicide attempt and 0.50% of the sample (*n* = 2) reported two or more attempts, which is comparable to rates found in the recent National Comorbidity Survey (Cougle, Keough, Riccardi, & Sachs-Ericsson, 2009) and in the Davis et al. (2014) study. The BSS has been widely used and has strong psychometric properties (Beck, Brown, & Steer, 1997). Based in part on guidance from the literature, I modeled passive SI using items 1-5 from the BSS in measurement and structural analyses related to Hypotheses 2 and 3. A CFA of these five items revealed good fit ($\chi 2$ [5] = 3.90, p = .56, TLI = .99, CFI = .99, RMSEA = .00 [90% CI = .00 - .06]), with standardized factor loadings ranging from .60 to .88. In the current sample, internal consistency for the five items was acceptable (α = .80), and approximately 13.90% (n = 62) of participants reported experiencing passive SI, as indicated by a summed score of 1 or greater. See Table C3 for relevant item content mapping.

IPTS constructs, The Interpersonal Needs Questionnaire (INQ) is a 15-item self-report measure designed to assess perceived burdensomeness (six items) and thwarted belongingness

(nine items). Items are presented on a seven-point Likert scale with response options ranging from 0 (*not at all true for me*) to 6 (*very true for me*). Six of the nine items assessing thwarted belongingness are reverse coded such that higher responses indicate greater belongingness. The INQ possesses good psychometric properties (Van Orden et al., 2012). In the current sample, internal consistency was high for both subscales ($\alpha = .96$ for perceived burdensomeness; $\alpha = .90$ for thwarted belongingness), mean score for perceived burdensomeness was 1.43 (*SD* = 1.00), and mean score for thwarted belongingness was 2.35 (*SD* = 1.28). In all models, I estimated the covariance between the residual terms of INQ items 11 and 12, based on guidance from the literature (Van Orden et al., 2012). While cutoff guidelines are not currently available for the INQ, mean perceived burdensomeness and thwarted belongingness scores in the sample were comparable to those reported by Davis et al. (2014).

Depressive symptomatology. Symptoms of depression were assessed using the Beck Depression Inventory-II (BDI-II), a widely used measure with good psychometric properties (e.g., Beck, Steer, & Brown, 1996). On the BDI-II, respondents are presented with 21 groups of statements describing depressive symptoms and are asked to select the one statement from each group that most closely matches how they have been feeling in the past two weeks. The statements range in severity on a scale from 0 to 3. In the current sample, internal consistency was high ($\alpha = .94$), and mean total score on the BDI-II was 10.31 (*SD* = 10.10). Further, 25.00% of the sample (*n* = 95) reported depressed mood based on a cutoff score of 16 specified in the BDI-II manual and verified in a sample of treatment-seeking university students (Sprinkle et al., 2002).

Importantly, comparison of the BDI-II and PCL-5 reveals multiple instances of content overlap. For example, BDI-II items 17 and 19 (irritability and difficulty concentrating) are

virtually identical to PCL items 15 *irritable behavior, angry outbursts, or acting aggressively* and 19 *having difficulty concentrating*. Tables B1 and B2 contain content descriptors for all study items for further comparison. To avoid potential conceptual overlap and related concerns regarding multicollinearity, only BDI-II item 1 (sadness) was originally planned to be included in analyses. However, for all models evaluated, inclusion of this item resulted in a failure to converge. Consequently it was excluded from all subsequent analyses.

Data Analytic Strategy

All analyses were performed in Mplus version 7.0 (Muthèn & Muthèn, 1998-2012) and IBM SPSS version 20.0. Descriptive statistics and item-level bivariate correlations between study variables can be found in Tables 2-5. As in Davis et al. (2014), examination of individual item distributions revealed that none closely approximated a normal distribution. Therefore, all variables were treated as ordered-categorical in structural analyses (Bentler & Chou, 1987), and a mean- and variance-adjusted weighted least squares (WLSMV) estimator was implemented for all analyses (Flora & Curran, 2004).

Missing data were handled using pairwise deletion, the default strategy used in Mplus for the WLSMV estimator (Muthèn & Muthèn, 1998-2012). As only a small proportion of the data was missing (covariance coverage values = .96 and .99 for all item pairs), use of pairwise deletion was deemed acceptable in keeping with Davis et al. (2014). Although multiple imputation (MI) was arguably a more robust option for handling missing data, pairwise deletion was employed because there is no established method for pooling fit indices across estimates in MI (Enders, 2010). This decision is further supported by findings from the Davis et al. (2014) study which found that use of MI yielded almost identical results as compared with pairwise deletion.

Finally, evaluation of model fit in all cases was accomplished with reference to cutoff guidelines recommended by Kline (2011). A variety of fit indices were examined. First, non-significant χ^2 values were considered an indication of good model fit (Hayduk, 1996). Second, Root Mean Square Error of Approximation (RMSEA) estimates were evaluated according to two hypotheses. If the lower limit of the 90% confidence interval (CI) for RMSEA fell below .05, I retained the null hypothesis that the model was a close fit. If the upper limit of the 90% CI for RMSEA fell above .10, I retained the null hypothesis that the model was a poor fit (Browne & Cudeck, 1993). Finally, values greater than or equal to .95 on Bentler's Comparative Fit Index (CFI) and the Tucker-Lewis Index were considered indicators of acceptable model fit (Hu & Bentler, 1999).

Results

Hypothesis 1: *DSM-5* PTSD Symptom Structure. Item mapping for both *DSM-5* and anhedonia models is provided in Table C1. After completion of both individual CFAs, fit was compared. To account for the fact that the WLSMV estimator was used, a two-step alternative procedure for χ^2 difference testing was employed using the 'DIFFTEST' command in Mplus (Muthén & Muthén, 1998-2012). This comparison was possible because the *DSM-5* model is nested within the anhedonia model (See Table C1).

The *DSM-5* model failed to demonstrate adequate fit. RMSEA (.09; 90% CI .08-.10) suggested that the close fit hypothesis should be rejected, and chi-square (χ^2 [164] = 678.23, p<.001) was outside acceptable range, while CFI (.96) and TLI (.96) were just within the acceptable range (see Table A1). However, the anhedonia model demonstrated acceptable fit. Specifically, although the chi-square test was significant (χ^2 [155] = 379.06, p<.001), all fit indices met cutoff criteria including RMSEA (.06; 90% CI .05-.07), CFI (.98), and TLI (.98). Finally, as hypothesized, chi-square difference testing confirmed that the anhedonia ($\Delta\chi^2$ (9) = 154.90, p<.01) model provided significantly better fit than the *DSM-5* model. Accordingly, the anhedonia model was used in all subsequent structural modeling.

Hypothesis 2: Bivariate Relationships with Emotional Numbing. Hypothesis 2 suggested that the anhedonia cluster would have a stronger relationship with perceived burdensomeness, thwarted belongingness and passive SI than any other cluster. To test Hypothesis 2, I ran a measurement model containing the six PTSD symptom clusters in the

anhedonia model, perceived burdensomeness, thwarted belongingness, and passive SI, all specified as latent variables, as well as gender specified as an observed variable. Covariances were estimated between all variables and are displayed in Table B6. Model fit was considered acceptable based on the majority of fit indices (χ^2 [735] = 1414.51, $p < .01$, RMSEA = .05 [90% CI = .05 - .05] TLI = .98, CFI = .98), and all standardized factor loadings were above the recommended guideline of .40 (ranging from .55-.99; Brown, 2006). Consistent with Hypothesis 2, relative to other PTSD symptom clusters, the anhedonia cluster had stronger bivariate relationships (i.e., standardized covariance estimates, see Table B6) with perceived burdensomeness (r = .68 compared to .36 - .59 for other clusters), thwarted belongingness (r = .63 compared to .35 - .53 for other clusters), and passive SI (r = .64 compared to .39 - .57 for other clusters). Examination of the 95% CIs surrounding each estimate confirmed that the bivariate relationship between anhedonia and perceived burdensomeness was significantly larger than that of any other cluster except dysphoric arousal. However, the relationship between anhedonia and passive SI was only significantly larger than the relationship between passive SI and avoidance, and was not significantly larger than the relationship between any other symptom cluster and thwarted belongingness. Taken together, these findings provide mixed support for Hypothesis 2. See Table B6 for all parameter estimates and associated 95% confidence intervals from the measurement model.

Hypothesis 3: Structural Models and Mediation Effects. Next, I specified a corresponding structural model in order to test the indirect effects of PTSD symptom clusters on passive SI, through perceived burdensomeness and thwarted belongingness, controlling for gender. This analysis revealed evidence of multicollinearity based on two sources. First, the standardized coefficients corresponding to the path from anhedonia to thwarted belongingness

was larger than 1.0 (β = 1.07, see Table B7), which can indicate multicollinearity (Kline, 2011). Second, a number of structural coefficients (specifically the paths from thwarted belongingness, avoidance, and dysphoric arousal to passive SI, and from various PTSD symptom clusters to both perceived burdensomeness and thwarted belongingness) were negative in the structural model, despite moderate, positive associations between the same pairs of variables in the corresponding measurement model (refer to Tables B6 and B7 for measurement and structural model estimates respectively). For example, dysphoric arousal and perceived burdensomeness had a non-significant negative association in the structural model (β = -.44, p = .12), despite their significant positive association in the corresponding measurement model (r = .53, p < .01). This flipping of signs between the measurement and structural models is a key marker of multicollinearity when predictors in the model are highly intercorrelated, as in this case (Cheung & Lau, 2008). The correlations between PTSD symptom clusters in particular were high enough to warrant concern. For example, dysphoric arousal and anhedonia were correlated .91, and reexperiencing and avoidance were correlated .89 in the full measurement model. Because multicollinearity can bias parameter estimates, these results were not interpreted. Instead, based on recommendations from the literature (Grewal, Cote, & Baumgartner, 2004; Kline, 2011), I re-specified the model.

Re-specification was patterned after the Davis et al. (2014) study, which found similar issues with multicollinearity, attributable at least in part to intercorrelation between PTSD clusters. Specifically, as in the Davis et al. (2014) study, I specified separate models for each PTSD symptom cluster—six models in all. Each model contained a single PTSD symptom cluster and gender, both of which had direct paths to with perceived burdensomeness, thwarted belongingness, and passive SI. In every case perceived burdensomeness and thwarted

belongingness were also specified as predictor variables with direct paths to passive SI, which served only as a criterion variable (see Figure A2). All of these models showed acceptable fit, based on examination of some fit statistics (i.e., CFI, TLI), but not others (i.e., RMSEA; see Table B8). None showed evidence of multicollinearity. Table B9 lists both standardized and unstandardized parameter estimates for each model. None of the direct paths from gender to thwarted belongingness, perceived burdensomeness, or passive SI was significant, and none of the symptom clusters were significantly correlated with gender. After models were specified and run to obtain parameter estimates, each was re-analyzed using a bias-corrected (BC) bootstrapping procedure with 5,000 resamplings (Preacher & Hayes, 2008), to estimate indirect effects—or the presence of mediation—in each model. The resulting indirect effect estimates and the associated 95% CIs for each symptom cluster through both perceived burdensomeness and thwarted belongingness are presented in Table B10.

Of note, results from the structural model containing anhedonia provided additional support for Hypothesis 2. Specifically, the magnitudes of the standardized direct path coefficients from anhedonia to perceived burdensomeness, thwarted belongingness, and passive SI were larger than the standardized coefficients for corresponding paths in any other individual cluster model (see Table B9). Additionally, a significantly greater proportion of the variance in passive SI was accounted for in the anhedonia model (R^2 = .76) compared to the reexperiencing model (R^2 = .25, see Table B9), although R^2 values for passive SI were comparable to that of the anhedonia model in all other cases.

However, contrary to Hypothesis 3, the anhedonia cluster structural model did not suggest a unique relationship between that cluster—relative to other PTSD clusters— and passive SI. Instead, the results of all individual cluster structural models were comparable, with

the exception of reexperiencing. The reexperiencing model accounted for the least variability by far in passive SI (R^2 = .25 compared with R^2 = .75-.76 for all other individual structural models), and showed a significantly smaller indirect effect on passive SI through perceived burdensomeness than all other symptom clusters (see Table B10), based on examination of 95% confidence intervals and discussed in further detail below. Consistent with Hypothesis 3, no PTSD cluster had a significant direct path to passive SI. However, all six clusters were indirectly related to passive SI through perceived burdensomeness, and none were significantly indirectly related to passive SI through thwarted belongingness. Thus, results provided partial support for the IPTS predictions that perceived burdensomeness and thwarted belongingness would be proximally related to passive SI, and that other variables would be indirectly related to passive SI through one or both constructs. Contrary to Davis et al. (2014), however, the relationship between anhedonia and passive SI did not differ from that of any other symptom cluster in structural models.

Alternative Analyses: Path Analytic Approach. The analytic approach described above and utilized by Davis et al. (2014) allows for examination of potential differential effects of individual symptom clusters on passive SI. However, based on the observation of multicollinearity in both Davis et al. (2014) and the present study, considering individual clusters is arguably not appropriate, at least in this sample. In both studies, the observed multicollinearity which prevented justifiable interpretation of the full structural model as intended was attributed at least in part to the degree of intercorrelation between PTSD symptom clusters. Given this high degree of overlap between the symptom clusters, it is reasonable to argue that it is most appropriate to consider PTSD as a unitary construct. Accordingly, I conducted a path analysis, in which total scores were computed for perceived burdensomeness, thwarted belongingness,

passive SI (BSS items 1-5), and PTSD, and analyzed as observed variables. The path model was specified such that gender and PTSD served as predictor variables for perceived burdensomeness and thwarted belongingness, and all variables (PTSD, gender, perceived burdensomeness, and thwarted belongingness) served as predictor variables for passive SI, the focal criterion variable. See Figure A3 for a depiction of the model as specified and Table B11 for associated standardized and unstandardized path estimates.

The results of the path model are largely consistent with those of the individual structural models with respect to perceived burdensomeness, but not thwarted belongingness. In the path model, perceived burdensomeness and thwarted belongingness both had significant direct paths to passive SI, whereas in the structural models perceived burdensomeness alone was related to passive SI. The parameter estimates between perceived burdensomeness, thwarted belongingness, and passive SI were similar in magnitude across path and structural models (see Table B11). Similarly, the path model showed that PTSD total score had significant direct paths to both IPTS constructs and, further, that PTSD was significantly indirectly related to passive SI through both perceived burdensomeness (as seen in structural models) and thwarted belongingness (see Table B11). Finally, the R^2 estimates in the path model corresponding to perceived burdensomeness (R^2 = .23), thwarted belongingness (R^2 = .21), and passive SI (R^2 = .38), were considerably smaller than those associated with all individual cluster structural models with the exception of the reexperiencing model (see Table B10). Overall, although this analysis was not planned, the results are consistent with study hypotheses and with what would be predicted by the IPTS. Study hypotheses were constructed in part based on observed conceptual similarities between thwarted belongingness and specific symptoms of PTSD. Based on this observed relationship, it was predicted that the association between PTSD—or certain PTSD

clusters—and passive SI was likely to be mediated by thwarted belongingness as well as perceived burdensomeness. This was demonstrated in the path model, but not in structural models. Similarly, the path model provides support for the IPTS prediction that both perceived burdensomeness and thwarted belongingness may serve as proximal causes of passive SI. The structural model findings, while not inconsistent with IPTS predictions, provide support for the role of perceived burdensomeness alone.

Discussion

This study was a replication and extension of Davis et al. (2014) —to date the only study to have examined relationships between specific PTSD symptom clusters and passive SI in the context of the IPTS — using *DSM-5* PTSD symptom criteria. As in Davis et al., this study examined all clusters based on the empirically derived model demonstrating best fit to the data, i.e., the six-factor anhedonia model (Liu et al., 2014). Hypotheses again were derived with reference to the IPTS, a theoretical model that provides a comprehensive account of the development of suicidal behavior. Thus, the aim of the present study was to elucidate the relationship between passive SI and PTSD as defined in *DSM-5*.

Study hypotheses were based on those of Davis et al. (2014), which were partially supported with respect to *DSM-IV* PTSD criteria. First, it was hypothesized that the anhedonia model for PTSD symptom structure proposed by Liu et al. (2014), which divided both NAMC and hyperarousal clusters in two, would provide better fit to the data than the model proposed in *DSM-5*. The anhedonia model was found by Liu et al. to have better fit than the *DSM-5* model, and more closely resembled the best-fitting model in Davis et al. (2014), which likewise subdivided both the cluster containing emotional numbing symptoms and the hyperarousal cluster. Thus, the first hypothesis was supported, and all subsequent analyses therefore modeled PTSD symptom structure according to the anhedonia model.

This finding reinforces that of Liu et al. (2014), suggesting that the four-cluster *DSM-5* model of PTSD may not accurately represent the structure of the disorder. As noted by Friedman et al. (2011), the *DSM-5* committee responsible for revising the PTSD criteria drew on the

empirical literature on PTSD factor structure in deciding to divide avoidance and numbing symptoms into separate clusters. However, the addition of new symptoms and revision of others for *DSM-5* may have rendered the existing factor analytic literature less applicable to the *DSM-5* symptom criteria. Further, studies recommending subdivision of the hyperarousal cluster (e.g., Elhai et al., 2011) appeared too recently to influence the process of revising the PTSD criteria for *DSM-5*.

In contrast, results of the present study largely failed to support the primary hypotheses (Hypotheses 2 and 3) concerning the significance of emotional numbing symptoms. Consistent with Hypothesis 2, the cluster containing PTSD's emotional numbing symptoms—the anhedonia cluster—had the largest bivariate relationship with perceived burdensomeness, thwarted belongingness, and passive SI among PTSD clusters. Unlike in Davis et al. (2014), however, in most of cases differences in the magnitudes of such relationships were not statistically significant. This suggests that despite apparent differences in the magnitude of observed relationships, anhedonia did not stand out among the PTSD clusters in terms of its association with passive SI.

Hypothesis 3 likewise failed to receive support, although it could not be tested as originally intended. Building on Hypothesis 2, Hypothesis 3 was that perceived burdensomeness, thwarted belongingness, or both, would mediate the relationship between the cluster containing numbing symptoms—the anhedonia cluster from the six-factor anhedonia model as it turned out— and passive SI. No other clusters were hypothesized to have either direct or indirect relationships with passive SI. The original intent (as in Davis et al., 2014) was to evaluate Hypothesis 3 using a model containing all PTSD symptom clusters, enabling evaluation of differential relationships between individual clusters and passive SI, with all others controlled

for. However, as in the previous study, multicollinearity prevented evaluation of such a model. Therefore, two alternative forms of analysis were implemented, only the first of which allowed for evaluation of Hypothesis 3.

First, replicating the solution adopted by Davis et al. (2014), separate structural models for each symptom cluster were specified. Contrary to expectations, the relationship between PTSD and the cluster containing the numbing symptoms judged most conceptually consistent with the IPTS constructs—the anhedonia cluster—did not differ from that of any other PTSD cluster in structural models. More specifically, the hypothesis that only the anhedonia cluster would have a significant indirect association with passive SI was not supported. Instead, all individual clusters—not just anhedonia—were significantly indirectly related to passive SI in their respective structural models, suggesting the relationship between anhedonia and passive SI was not unique relative to other clusters, at least when evaluated separately.

Notably, in each case the significant indirect relationship was through perceived burdensomeness, not thwarted belongingness. Likewise, in every individual structural model perceived burdensomeness was the only construct with a significant direct path to passive SI. Both perceived burdensomeness and thwarted belongingness were significantly related to every individual PTSD cluster in individual clusters' structural models, but in no case was thwarted belongingness significantly related to passive SI. Although each PTSD cluster was indirectly related to passive SI through perceived burdensomeness, thwarted belongingness did not appear to play a significant independent role. Evidence from individual cluster structural models also failed to support Hypothesis 2. For example, the anhedonia model did not account for more variance in passive SI than did any other cluster's structural model with the exception of

reexperiencing. Taken together, these findings do not identify anhedonia, or any individual symptom cluster, as being uniquely related to passive SI.

Analyses involving the separate consideration of each PTSD symptom cluster were completed in the interest of evaluating the relationships between each cluster, the IPTS constructs, and passive SI separately. As discussed, cluster-level analysis was considered essential based on the conceptualization of PTSD as a disorder involving distinct clusters of symptoms, each with different correlates and capable of affecting different outcomes (Asmundson et al., 2004). However, the appearance of multicollinearity in both the present study and Davis et al. (2014), apparently attributable in both cases to the high degree of PTSD cluster intercorrelation, suggests that separate examination of PTSD clusters in this case is both methodologically and conceptually inappropriate. Methodologically, separate consideration of constructs with such considerable overlap is difficult to justify (Kline, 2011). Conceptually, findings based on models containing single PTSD clusters in isolation are likely not generalizable. Such analyses do not correspond with the current conceptualization of PTSD as a multifaceted mental disorder which requires for diagnosis the simultaneous presence of symptoms from multiple distinct clusters.

Given the occurrence of similar problems in the Davis et al. (2014) study, it seems likely that multicollinearity was attributable at least in part to the nature of the samples examined in each. Although the samples were non-overlapping—collected at different times—both were collected from a demographically similar pool of undergraduates at the same public university. Limited variability in symptom endorsement due to the non-clinical nature of the samples may have contributed to the unusually high inter-item and inter-cluster correlations and affected multicollinearity. Both the inability to consider separate clusters simultaneously in a single

model and the non-clinical nature of the sample were significant limitations of this study. To address these limitations and concerns about the appropriateness of examining PTSD clusters separately given multicollinearity, a second, alternative analysis was conducted. Specifically, a path model was specified in which all PTSD symptoms were summed to form one observed variable. Findings from the path model were identical to those observed in each individual symptom cluster model except as pertained to thwarted belongingness. When PTSD symptom severity rather than any individual cluster was examined, both perceived burdensomeness and thwarted belongingness were significantly related to passive SI, and PTSD was likewise indirectly related to passive SI through both IPTS constructs. Thus, the path model findings confirmed the predictions of the IPTS that perceived burdensomeness and thwarted belongingness were proximally related to passive SI while PTSD was more distally related through both constructs (Van Orden et al., 2010).

In sum, results concerning perceived burdensomeness and thwarted belongingness were inconsistent across analytic approaches in this study, and only partially consistent with findings resulting from corresponding analyses in Davis et al. (2014). Whereas the current study found that thwarted belongingness was significantly associated with SI only in the path analysis, Davis et al. found that the construct was significantly associated with passive SI in some, but not all, specified individual structural models. Further, in Davis et al., perceived burdensomeness likewise partially mediated the relationship between all symptom clusters and passive SI, but thwarted belongingness served as a significant mediator in only two of the five individual structural models.

One possible explanation for the disparity in findings across studies is that the studies utilized different versions of *DSM*. Differences in symptom cluster content might have accounted

for apparent differences in results concerning thwarted belongingness across analyses. For example, three symptoms added to or substantially revised for the *DSM-5* PTSD criteria (distorted negative cognitions, beliefs, and blame) are conceptually similar to depressive symptoms. Similarly, both perceived burdensomeness and thwarted belongingness are themselves arguably examples of distorted negative cognitions or beliefs. Recognition of this fact raises questions concerning the extent to which *DSM-5* has integrated perceived burdensomeness and thwarted belongingness into the criteria for PTSD, rendering consideration of them as distinct constructs problematic.

The nature of the relationship between PTSD as currently defined in *DSM-5* and the IPTS constructs warrants closer, more deliberate, focused examination. In the present study, however, insufficient evidence exists to support the idea that PTSD/IPTS construct overlap explains the differential functioning of thwarted belongingness across analyses. In fact, several pieces of evidence appear to suggest that changes in the referenced *DSM* criteria are not responsible for such differences. For example, comparison of the present study with findings from Davis et al. (2014) reveals that differences exist in individual structural model results for clusters that did not change substantively from *DSM-IV* to *DSM-5* (e.g., reexperiencing, which underwent only minor symptom rewording).

Even when symptom changes were minimal, findings were inconsistent with those of Davis et al. (2014). A more likely explanation is that differences are attributable to cross-sample variability in symptom presentation. Specifically, in the full latent measurement model containing all individual PTSD clusters, the estimated bivariate relationship between perceived burdensomeness and passive SI is large enough (r = .86, see Table B6) to potentially contribute to concerns about multicollinearity. Thus, the high degree of intercorrelation between perceived

burdensomeness and passive SI may have obscured findings between thwarted belongingness and passive SI. The choice to treat all variables as observed in the path analysis may have eliminated some of the issues apparent in latent modeling, enabling observation of the relationship between thwarted belongingness as well as perceived burdensomeness and passive SI.

Although findings differed slightly across structural and path modeling approaches, both supported the utility of the IPTS in understanding suicidal behavior among those with PTSD. Perceived burdensomeness and thwarted belongingness may not fully account for the relationship between PTSD symptoms and passive SI—limitations of the sample and the choice to test for partial, not full, mediation based on the findings of Davis et al. (2014) prevent such an assertion. Further studies in similar undergraduate samples, such as that conducted by Nadorff, Anestis, Nazem, Harris, and Winer (2014), have demonstrated that variables outside the IPTS may serve as proximal causes of SI. Like Davis et al. (2014), Nadorff et al. (2014) found that insomnia and nightmares were significantly related to SI even when perceived burdensomeness, thwarted belongingness, and a variety of other variables were controlled for. Thus, evidence across studies suggests that the IPTS constructs are not sufficient to explain suicidal behavior in all cases. However, in the present study, all mediational analyses suggested that at least perceived burdensomeness should be treated as a significant variable to consider in understanding the prevalence of passive SI in this population. Further, the high amount of variability in passive SI accounted for by most of the individual symptom cluster models (R^2 = .75- .76 in all but the reexperiencing model) suggests that the addition of the IPTS constructs significantly enhanced the ability to account for passive SI in this population.

Notably, despite broad support for the utility of the IPTS in this context, findings concerning thwarted belongingness in the present study were inconsistent with the observations used to generate hypotheses. Specifically, the PTSD symptoms composing the anhedonia cluster—including alienation from others—were observed to be theoretically consistent with thwarted belongingness, not perceived burdensomeness. Not only was anhedonia not more robustly related to passive SI compared to other clusters in individual cluster structural models; the cluster was indirectly related to passive SI through perceived burdensomeness alone. One possible explanation for this result is, as noted, that in this specific sample perceived burdensomeness was more strongly associated with passive SI than thwarted belongingness. However, other studies in the IPTS literature (e.g., Bryan et al., 2012) have likewise supported the posited link between perceived burdensomeness and SI, but failed to find similar support for thwarted belongingness.

One proposed explanation for the tendency to find greater support for perceived burdensomeness than thwarted belongingness as a predictor of SI is that the relationship between SI and perceived burdensomeness is more robust. Some research (e.g., Bryan et al., 2010) has suggested that thwarted belongingness may be more transient, associated with acute episodes of depression or distress, while perceived burdensomeness represents a more enduring pattern of distress and interpersonal disconnection. To date, these hypotheses have not been explicitly tested and confirmed. Hill and Petit (2014) provided a comprehensive summary of evidence supporting the relationship between perceived burdensomeness and suicidal behavior, and noted that, to date, perceived burdensomeness has received less empirical attention than thwarted belongingness, in part because thwarted belongingness was implicated as a risk factor for suicide

before publication of the IPTS. Based on the findings of the present study, continued research focus on perceived burdensomeness in the context of suicidal behavior is indicated.

The present study had several methodological limitations. Two major limitations of this study—the non-clinical nature of the sample and the inability to consider all PTSD clusters together in one structural model—have already been mentioned. A third limitation of the sample was the relative lack of diversity (mostly White, female undergraduates). Although I controlled for gender in all analyses, findings should be replicated in samples with greater racial and ethnic diversity to determine generalizability.

A fourth limitation was that this study was cross-sectional and correlational in nature, which prevents inferences concerning causal relationships between study variables (Pearl, 2000), and data were collected exclusively via self-report. Ideally, future research would be longitudinal to provide information about temporal relationships between variables and would utilize clinician-administered measures. A fifth limitation was that the sample included participants with a variety of different types of trauma, which masks potential differences in the presentation of passive SI or IPTS constructs across type of trauma. Especially given the focus of hypotheses on interpersonal disconnection, it is reasonable to hypothesize that differences exist in the appearance and apparent cause of suicidal behavior among survivors of interpersonal trauma (e.g., rape) in comparison to non-interpersonal trauma (e.g., natural disaster). To our knowledge, no studies have yet explicitly examined this possibility.

The current study represents a significant contribution to literature on the relationship between PTSD and passive SI. First, it extends the findings of Davis et al. (2014) to *DSM-5*, opening the door to exploration of the relationship between suicidal behavior and PTSD according to the revised definition now in use in clinical settings. Second, it provides additional

support for use of and reference to the IPTS in understanding suicidal behavior among those with PTSD. In particular, findings implicate perceived burdensomeness as a significant potential indicator, and possible cause of suicidal behavior among those exposed to trauma and suffering from symptom of PTSD. In spite of the noted methodological limitations of the present study, the implication that feeling like a burden may influence the development, or indicate the likely presence, of SI among those with PTSD is important for clinicians to consider.

One of the primary aims of this study was to extend findings concerning the PTSD/SI relationship by establishing that the general relationship persisted given the revised *DSM-5* definition of PTSD. The findings, while not completely consistent with hypotheses, supported the association between *DSM-5* defined PTSD and SI. However, additional research should continue to investigate the extent to which specific changes to the symptom make-up of the disorder affect the relationship between the disorder and other constructs, including those likely to be relevant to the development of suicidal behavior. For example, PTSD and major depressive disorder (MDD) have long been acknowledged as highly comorbid, due in part to symptom overlap as described above in the *Method* section. The addition of depressogenic thoughts and beliefs as symptoms of PTSD may result in heightened rates of comorbidity with depression and higher rates of constructs related to depression such as perceived burdensomeness and thwarted belongingness. Future research should seek to disentangle the nature of the relationship between PTSD as currently defined and such IPTS constructs: Do they frequently co-occur based on mutual association with a third variable like MDD; is there a causal relationship (e.g., PTSD giving rise to feelings of perceived burdensomeness); or are they more accurately conceptualized as overlapping constructs? Examination of such questions would optimally involve use of a clinical sample to increase variability in symptom reporting, and a longitudinal design to allow

for the establishment of causality based on observation of the temporal relationship between the relevant variables.

Given the support found for the utility of the IPTS in this and other studies, another important step is to extend examination of the relationships between PTSD symptom clusters as defined by *DSM-5* to other, more severe forms of suicidal behavior. Reference to the IPTS when examining the relationship between PTSD and suicide attempts (SA), for instance, enables understanding of the mechanistic relationships between PTSD and SA. Some research has already established the relationship between PTSD as defined in *DSM-IV* and acquired capability, the construct which according to the IPTS serves as a proximal cause for SA (Silva, Ribiero, & Joiner, 2015). Sealman, Chatrand, Bolton, and Sareen (2013) examined the relationship between PTSD symptoms and history of suicide attempts in a large national survey sample, but did not integrate findings with the suicide theory such as the IPTS, arguably limiting explanations for the significance of specific identified symptoms. Studies examining the relationship between PTSD and SA using the IPTS should be conducted using the revised *DSM-5* criteria, and should consider examining PTSD at cluster level rather than as a syndrome, at least in clinical samples. Doing so will enable identification of potential clinically relevant differential relationships between individual *DSM-5* PTSD clusters and acquired capability and, by extension, risk for death by suicide.

References

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Arlington, VA: American Psychiatric Publishing.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.

Armour, C., Tsai, J., Durham, T. A., Charak, R., Biehn, T. L., Elhai, J. D., & Pietrzak, R. H. (2015). Dimensional structure of DSM-5 posttraumatic stress symptoms: Support for a hybrid anhedonia and externalizing behaviors model. *Journal of Psychiatric Research, 61*, 106-113.

Asmundson, G. J. G, Stapelton, J. A., & Taylor, S. (2004). Are avoidance and numbing distinct PTSD symptom clusters? *Journal of Traumatic Stress, 17*, 467-475.

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin, 117*, 497-529.

Beck, A. T., & Steer, R. A. (1991). *Manual for Beck Scale for Suicide Ideation.* New York: Psychological Corporation.

Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Manual for the Beck Depression Inventory-II.* San Antonio, TX: Psychological Corporation.

Beck, A. T., Brown, G. K., & Steer, R. A. (1997). Psychometric characteristics of the Scale for Suicide Ideation with psychiatric outpatients. *Behaviour Research and Therapy, 35*, 1039-1046.

Blake, D. D., Weathers, F. W., Nagy, L. M., Kaloupek, D. G., Charney, D. S., & Keane, T. M. (2004). Clinician-Administered PTSD Scale. Los Angeles: Western Psychological Services.

Blevins, C. A., Weathers, F. W., Davis, M. T., Witte, T. K., & Domino, J. D. (2015). *The Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5): Development and initial psychometric evaluation.* Manuscript submitted for publication.

Bryan, C., Cukrowicz, K. C., West, C. L., & Morrow, C. E. (2010). Combat experience and the acquired capability of suicide. *Journal of Clinical Psychology, 66,* 1044-1056.

Bryan, C., & Anestis, M. (2011). Reexperiencing symptoms and the interpersonal-psychological theory of suicidal behavior among deployed service members evaluated for traumatic brain injury. *Journal of Clinical Psychology, 67,* 1-10.

Bryan, C. J., Hernandez, A. M., Allison, S., & Clemans, T. (2013). Combat exposure and suicide risk in two samples of military personnel. *Journal of Clinical Psychology, 69,* 64-77.

Centers for Disease Control (2013). Suicide among adults aged 35–64 years — United States, 1999–2010. *Morbidity and Mortality Weekly Report, 62,* 321-325.

Cheung, G. W. & Lau, R. S. (2008). Testing mediation and suppression effects of latent variables: Bootstrapping with structural equation models. *Organizational Research Methods, 11,* 296-325.

Conner, K. R., Bossarte, R. M., He, H., Arora, J., Lu, N., Tu, X., & Katz, I. (2014). Posttraumatic stress disorder and suicide in 5.9 million individuals receiving care in the Veterans Health Administration health system. *Journal of Affective Disorders, 166,* 1-5.

Davis, M. T., Witte, T. K., & Weathers, F. W. (2014). Posttraumatic stress disorder and suicidal ideation: The role of specific symptoms within the framework of the interpersonal-

psychological theory of suicide. *Psychological Trauma: Research, Practice, and Policy*. *6,* 610-618.

Davis, M. T., Witte, T. K., Weathers, F. W., & Blevins, C. A. (2014). The role of posttraumatic stress disorder symptom clusters in the prediction of passive suicidal ideation. *Psychological Trauma: Theory, Research, Practice, and Policy, 6,* S82-S91.

Elhai, J., Biehn, T. L., Armour, C., Klopper, J., Frueh, C., & Palmieri, P. (2011). Evidence for a unique PTSD construct represented by PTSD's D1-D3 symptoms. *Journal of Anxiety Disorders, 25,* 340-345.

Elhai, J., & Palmieri, P. (2011). The factor structure of posttraumatic stress disorder: A literature update, critique of methodology, and agenda for future research. *Journal of Anxiety Disorders, 25,* 840-854.

Flora, D. B., & Curran, P. J. (2004). An empirical investigation of alternative methods of estimation for confirmatory factor analysis with ordinal data. *Psychological Methods, 9,* 466-491.

Friedman, M. J., Resick, P., Bryant, R, & Brewin, C. R. (2011). Considering PTSD for DSM-5. *Depression and Anxiety, 28,* 750–769.

Gray, M., Litz, B., Hsu, J., & Lombardo, T. (2004). Psychometric properties of the Life Events Checklist. *Assessment, 11,* 330-341.

Guerra, V. S., & Calhoun, P. S. (2011). Examining the relation between posttraumatic stress disorder and suicidal ideation in an OEF/OIF veteran sample. *Journal of Anxiety Disorders,* 25, 12-18.

Hellmuth, J., Stappenbeck, C. A., Hoerster, K. D., & Jakupcak, M. (2012) Modeling PTSD symptom clusters, alcohol, and depression as they relate to aggression and suicidality in returning U.S. veterans. *Journal of Traumatic Stress, 25*, 527-534.

Inoue, K., Tanii, H., Kaiya, H., Abe, S., Nishimura, Y., Masaki, M., & Fukunaga, T. (2007). The correlation between unemployment and suicide rates in Japan between 1978 and 2004. *Legal Medicine, 9,* 139–142.

Joiner, T. (2005). *Why people die by suicide*. Cambridge, MA: Harvard University Press.

Jones, L. K., & Cureton, J. L. (2014). Trauma re-defined in the DSM-5: Rational implications for counseling practice. *The Professional Counselor, 4*, 257-281.

Kaplan, M. S., McFarland, B. H., Huguet, N., & Newsom, J. T. (2007). Physical illness, functional limitations, and suicide risk: A population based study. *American Journal of Orthopsychiatry, 77,* 56–60.

Kline, R. B. (2011). *Principles and practice of structural equation modeling* (3rd ed.). New York, NY: Guilford Press.

Knox, K.L. (2008). Epidemiology of the relationship between traumatic experience and suicidal behaviors. *PTSD Research Quarterly, 19(4),* 1-3.

Krysinska, K, & Lester, D. (2010). Post-traumatic stress disorder and suicide risk: A systematic review. Ar*chives of Suicide Research, 14,* 1-23.

Lusk, J., Brenner, L. A., Betthauser, L. M., Terrio, H., Scher, A. I., Schwab, K., & Poczwardowski, A. (2015). A qualitative study of potential suicide risk factors among Operation Iraqi Freedom/Operation Enduring Freedom soldiers returning to the Continental United States (CONUS). *Journal of Clinical Psychology*. Advanced online publication. doi: 10.1002/jclp.22164.

McDonald, S. D., & Calhoun, P. (2010). The diagnostic accuracy of the PTSD Checklist: A critical review. *Clinical Psychology Review, 30*, 976-987.

Monteith, L., Menefee, D., Petit, J., Leopoulos, W., & Vincent, J. (2013). Examining the interpersonal-psychological theory of suicide in an inpatient veteran sample. *Suicide and Life-Threatening Behavior, 43*, 418-428.

Muthèn, L. K., & Muthèn, B. O. (1998-2013) *Mplus user's guide* (7th ed.). Los Angeles, California: Muthèn & Muthèn.

Nock, M. K., Hwang, I., Sampson, N., Kessler, R. C., Angermeyer, M., Beautrais, A., Williams, D. R., et al. (2009). Cross-national analysis of the associations among mental disorders and suicidal behavior: Findings from the WHO World Mental Health Surveys. *PLoS Medicine, 6*, 856.

Panagioti, M., Gooding, P., & Tarrier, N. (2009). Post-traumatic stress disorder and suicidal behavior: A narrative review. *Clinical Psychology Review, 29*, 471–482.

Panagioti, M., Gooding, P., Dunn, G., & Tarrier, N. (2011). Pathways to suicidal behavior in posttraumatic stress disorder. *Journal of Traumatic Stress, 24*, 137-145.

Panagioti, M., Gooding, P., & Tarrier, N. (2012). A meta-analysis of the association between posttraumatic stress disorder and suicidality: The role of comorbid depression. *Comprehensive Psychiatry, 53*, 915-930.

Panagioti, M., Gooding, P., Taylor, P. J., & Tarrier, N. (2014). Perceived social support buffers the impact of PTSD symptoms on suicidal behavior: Implications into suicide resilience research. *Comprehensive Psychiatry, 55*, 104-112.

Panagioti, M., Gooding, P. A., Triantafyllou, K., & Tarrier, N. (2014). Suicidality and posttraumatic stress disorder (PTSD) in adolescents: A systematic review and meta-analysis. *Social Psychiatry and Psychiatric Epidemiology, 50*, 525-537.

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40,* 879-891.

Silva, C., Ribeiro, J. D., & Joiner, T. E. (2015). Mental disorders and thwarted belongingness, perceived burdensomeness, and acquired capability for suicide. *Psychiatry Research*, 226, 316-327.

Schoenbaum, M., Kessler, R. C., Gilman, S. E., Colpe, L. J., Heeringa, S. G., Stein, M. B., ... & Cox, K. L. (2014). Predictors of suicide and accident death in the Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS): Results from the Army Study to Assess Risk and Resilience in Service members (Army STARRS). *JAMA Psychiatry*, *71*, 493-503.

Van Orden, K. A., Cukrowicz, K. C., Witte, T. K., & Joiner, T. E. (2012). Thwarted belongingness and perceived burdensomeness: Construct validity and psychometric properties of the Interpersonal Needs Questionnaire. *Psychological Assessment*, *24,* 197-215.

Weathers, F., Litz, B., Herman, D., Juska, J., & Keane, T. (1993, November). *The PTSD Checklist (PCL): Reliability, validity, and diagnostic utility.* Presentation at the annual meeting of the International Society for Traumatic Stress Studies, San Antonio, TX.

Weathers, F.W., Blake, D.D., Schnurr, P.P., Kaloupek, D.G., Marx, B.P., & Keane, T.M.

(2013). The Life Events Checklist for DSM-5 (LEC-5). Instrument available from the National Center for PTSD at www.ptsd.va.gov.

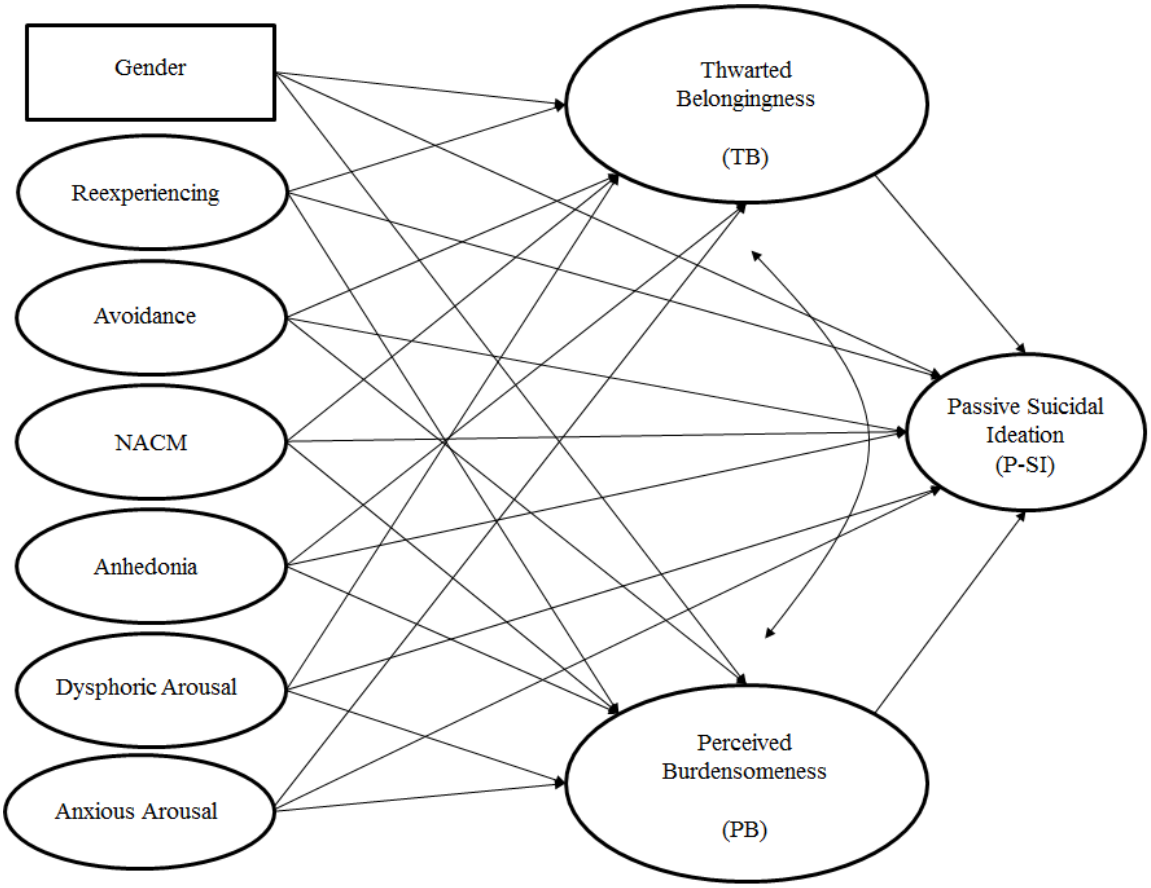
Weathers, F.W., Litz, B.T., Keane, T.M., Palmieri, P. A., Marx, B. P., & Schnurr, P.P. (2013). *The PTSD Checklist for DSM-5 (PCL-5)*. Scale available from the National Center for PTSD at www.ptsd.va.gov.

Weathers, F. W., Keane, T. M., & Davidson, J. R. (2001). Clinician-Administered PTSD Scale: A review of the first ten years of research. .*Depression and Anxiety*, *13*, 132-156.

Appendix A: Figures

Figure A1

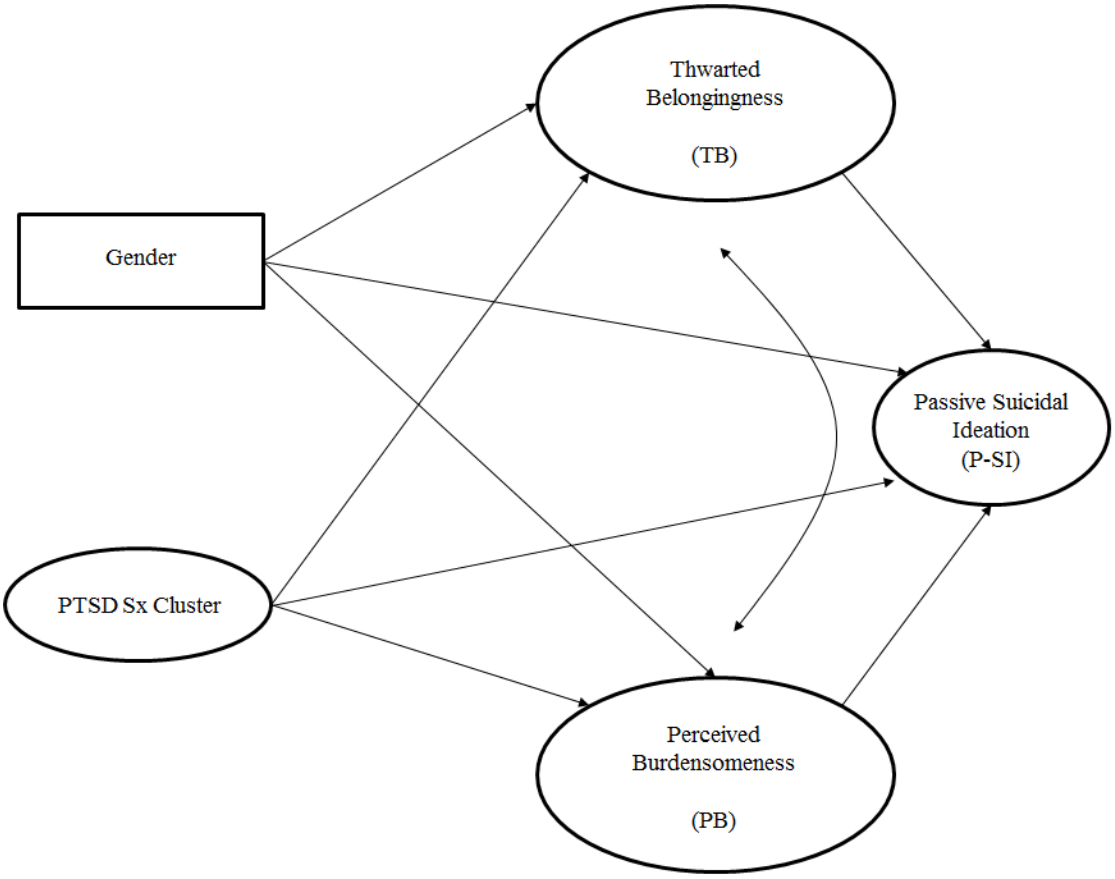
Full Specified Structural Model (Hypothesis 3)



Note. Covariance values between all PTSD symptom clusters, gender, and sadness, and between PB and TB were also be estimated, but are not depicted in this diagram to enhance readability. NACM = negative alterations in cognitions and mood.

Figure A2

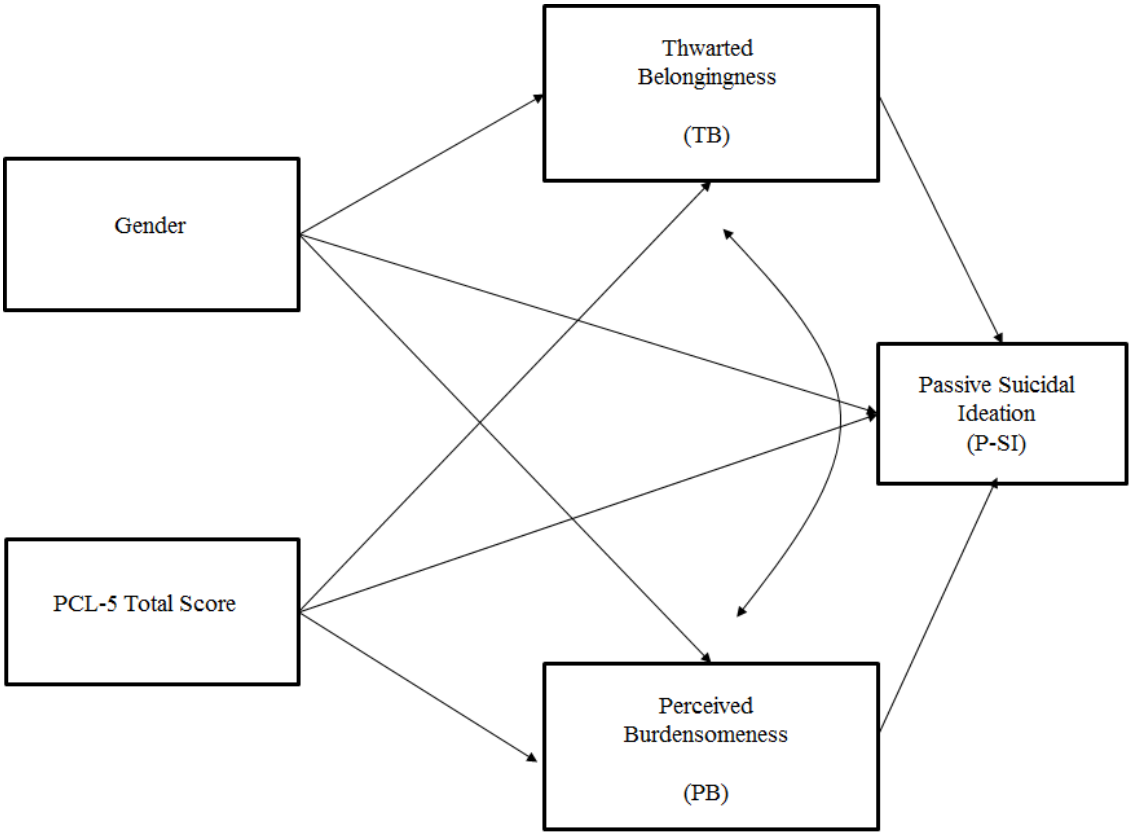
Individual Symptom Cluster Models with all Specified Paths.



Note. PTSD = posttraumatic stress disorder; Sx = symptom.

Figure A3

Full Specified Path Model



Note. PCL-5 = PTSD Checklist for *DSM-5*.

Appendix B: Tables

Table B1

Fit Statistics for Both DSM-5 and Anhedonia Models of PTSD Symptom Structure.

Model	χ^2 (p-value)	df	RMSEA Estimate (90% CI)	CFI	TLI	χ^2 Difference (p-value)[a]	df for χ^2 difference
DSM-5 Model (4 factors)	678.23 ($p \leq .01$)	164	.09 (.08-.10)	.96	.96		
Anhedonia Model (6 factors)	379.06 ($p \leq .01$)	155	.06 (.05-.07)	.98	.98	154.90($p \leq .01$)	9

Note. DSM-5 model = four-factor model as specified in *DSM-5* (APA, 2013); Anhedonia model = six-factor model proposed by Liu et al. (2014); df= degrees of freedom; RMSEA = Root Mean Square Error of Approximation; CFI = Bentler Comparative Fit Index; TLI = Tucker-Lewis Index. [a] Reported chi-squared difference tests reflect comparison with the dysphoric arousal model. A two-step alternative procedure for χ^2 difference testing was employed using the 'DIFFTEST' command in Mplus to account for the fact that the WLSMV estimator was used.

Table B2

Descriptive Statistics for Items Used in Structural Analyses.

Variable	Minimum	Maximum	Mean	SD	Skew	Kurtosis
Reexperiencing						
PCL-5 item 1	1.00	5.00	2.11	1.12	.84	-.06
PCL-5 item 2	1.00	5.00	1.75	1.04	1.41	1.26
PCL-5 item 3	1.00	5.00	1.68	1.04	1.52	1.54
PCL-5 item 4	1.00	5.00	2.34	1.26	.61	-.70
PCL-5 item 5	1.00	5.00	1.90	1.19	1.15	.21
Avoidance						
PCL-5 item 6	1.00	5.00	2.30	1.26	.66	-.68
PCL-5 item 7	1.00	5.00	2.07	1.26	.97	-.23
NACM						
PCL-5 item 8	1.00	5.00	1.76	1.05	1.36	1.06
PCL-5 item 9	1.00	5.00	1.63	1.04	1.73	2.17
PCL-5 item 10	1.00	5.00	1.72	1.13	1.55	1.35
PCL-5 item 11	1.00	5.00	1.90	1.14	1.22	.59
Anhedonia						
PCL-5 item 12	1.00	5.00	1.51	.92	1.95	3.23
PCL-5 item 13	1.00	5.00	1.60	1.02	1.77	2.33
PCL-5 item 14	1.00	5.00	1.48	.92	2.06	3.69
Dysphoric Arousal						
PCL-5 item 15	1.00	5.00	1.53	.90	1.93	3.48

(continued)

Variable	Minimum	Maximum	Mean	SD	Skew	Kurtosis
Dysphoric Arousal						
PCL-5 item 16	1.00	5.00	1.37	.79	2.33	5.21
PCL-5 item 19	1.00	3.00	1.86	1.18	1.20	.32
PCL-5 item 20	1.00	5.00	1.85	1.21	1.26	.43
Anxious Arousal						
PCL-5 item 18	1.00	5.00	1.98	1.23	1.07	.03
PCL-5 item 17	1.00	3.00	1.74	1.08	1.38	1.02
Perceived Burdensomeness						
INQ item 1	0.00	6.00	.43	1.10	3.14	10.52
INQ item 2	0.00	6.00	.42	1.03	3.02	9.82
INQ item 3	0.00	6.00	.45	1.12	2.96	9.06
INQ item 4	0.00	6.00	.34	1.01	3.51	12.92
INQ item 5	0.00	6.00	.35	.99	3.32	11.48
INQ item 6	0.00	6.00	.65	1.33	2.25	4.48
Thwarted Belongingness						
INQ item 7	0.00	6.00	1.17	1.71	1.68	1.95
INQ item 8	0.00	6.00	1.68	1.80	1.03	.21
INQ item 9	0.00	6.00	1.20	1.77	1.43	.86
INQ item 10	0.00	6.00	1.10	1.58	1.59	1.86
INQ item 11	0.00	6.00	1.55	1.82	.87	-.47
INQ item 12	0.00	6.00	1.72	1.93	.81	-.59
INQ item 13	0.00	6.00	1.18	1.63	1.48	1.48

(continued)

Variable	Minimum	Maximum	Mean	SD	Skew	Kurtosis
Thwarted Belongingness						
INQ item 14	0.00	6.00	1.32	1.63	1.27	.88
INQ item 15	0.00	6.00	1.25	1.63	1.35	1.12
Passive Suicidal Ideation						
BSS item 1	0.00	1.00	.06	.26	4.49	21.45
BSS item 2	0.00	2.00	.12	.35	2.86	7.88
BSS item 3	0.00	1.00	.06	.27	4.76	24.19
BSS item 4	0.00	3.00	.05	.23	3.95	13.66
BSS item 5	0.00	2.00	.07	.30	4.43	20.63

Note. SD = Standard Deviation; PCL-5 = PTSD Checklist for *DSM-5*; NACM = negative alterations in cognitions and mood; INQ = Interpersonal Needs Questionnaire; PB = perceived burdensomeness; TB = thwarted belongingness; BSS = Beck Suicide Scale.

Table B3

PTSD Checklist for DSM-5 Interitem Correlations

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. PCL-5 1	1.00																			
2. PCL-5 2	.76*	1.00																		
3. PCL-5 3	.66*	.66*	1.00																	
4. PCL-5 4	.70*	.58*	.58*	1.00																
5. PCL-5 5	.66*	.63*	.67*	.70*	1.00															
6. PCL-5 6	.65*	.53*	.50*	.69*	.58*	1.00														
7. PCL-5 7	.60*	.54*	.56*	.64*	.61*	.73*	1.00													
8. PCL-5 8	.26*	.27*	.27*	.27*	.30*	.33*	.31*	1.00												
9. PCL-5 9	.47*	.48*	.42*	.48*	.47*	.47*	.48*	.45*	1.00											
10.PCL-5 10	.50*	.45*	.36*	.48*	.53*	.47*	.51*	.30*	.60*	1.00										
11.PCL-5 11	.58*	.56*	.51*	.59*	.39*	.42*	.30*	.31*	.60*	.67*	1.00									
12.PCL-5 12	.48*	.53*	.42*	.42*	.52*	.36*	.46*	.27*	.57*	.51*	.51*	1.00								
13.PCL-5 13	.48*	.48*	.39*	.40*	.40*	.37*	.49*	.33*	.67*	.49*	.53*	.75*	1.00							
14.PCL-5 14	.47*	.51*	.41*	.44*	.47*	.40*	.42*	.31*	.67*	.49*	.53*	.75*	.79*	1.00						
15. PCL-5 15	.51*	.51*	.41*	.43*	.46*	.40*	.40*	.30*	.57*	.46*	.49*	.61*	.63*	.73*	1.00					
16. PCL-5 16	.27*	.31*	.27*	.27*	.29*	.22*	.24*	.20*	.44*	.31*	.26*	.47*	.48*	.51*	.56*	1.00				
17. PCL-5 17	.59*	.58*	.55*	.48*	.55*	.44*	.47*	.28*	.41*	.41*	.49*	.43*	.46*	.40*	.43*	.35*	1.00			
18. PCL-5 18	.55*	.54*	.56*	.50*	.60*	.44*	.46*	.33*	.46*	.36*	.48*	.46*	.44*	.46*	.50*	.28*	.68*	1.00		
19. PCL-5 19	.47*	.46*	.42*	.45*	.43*	.38*	.39*	.28*	.57*	.43*	.51*	.60*	.68*	.62*	.66*	.39*	.51*	.58*	1.00	
20. PCL-5 20	.49*	.53*	.45*	.44*	.46*	.37*	.37*	.30*	.57*	.39*	.54*	.54*	.60*	.58*	.56*	.37*	.48*	.56*	.76*	1.00

Note. PCL-5 = PTSD Checklist for *DSM-5* (PCL-5).
* $p \leq .05$.

Table B4

Bivariate Correlations Between PCL-5 Items and Other Study Variables

Variable	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20
INQ 1	.32	.36	.21	.24	.27	.45	.24	.27	.45	.30	.32	.48	.49	.55	.43	.39	.28	.31	.34	.39
INQ 2	.31	.37	.22	.26	.23	.40	.26	.23	.40	.29	.32	.46	.46	.53	.39	.38	.29	.31	.29	.35
INQ 3	.31	.35	.22	.22	.28	.47	.2	.28	.48	.30	.32	.45	.48	.52	.43	.38	.29	.30	.33	.38
INQ 4	.31	.38	.23	.23	.21	.41	.23	.21	.41	.28	.30	.45	.47	.53	.38	.39	.25	.23	.24	.33
INQ 5	.23	.30	.21	.21	.19	.34	.21	.19	.34	.29	.31	.41	.38	.43	.34	.36	.21	.22	.23	.28
INQ 6	.29	.33	.19	.22	.29	.44	.22	.29	.44	.30	.33	.46	.47	.49	.40	.34	.28	.32	.35	.36
INQ 7	.12	.22	.16	.09	.13	.24	.09	.13	.24	.11	.17	.27	.27	.34	.28	.21	.09	.14	.17	.17
INQ 8	.26	.31	.18	.21	.24	.33	.20	.24	.33	.20	.25	.34	.41	.40	.34	.22	.27	.22	.29	.27
INQ 9	.11	.15	.14	.17	.20	.26	.17	.20	.26	.14	.19	.28	.30	.29	.29	.22	.19	.22	.31	.24
INQ10	.21	.30	.17	.24	.14	.25	.24	.14	.25	.14	.26	.35	.37	.37	.29	.20	.21	.18	.23	.20
INQ 11	.25	.28	.17	.28	.23	.39	.28	.23	.39	.26	.35	.41	.51	.47	.38	.28	.33	.32	.44	.40
INQ 12	.28	.28	.16	.29	.27	.38	.29	.27	.38	.26	.32	.38	.48	.43	.39	.25	.38	.35	.44	.41
INQ 13	.15	.25	.17	.26	.14	.26	.26	.14	.26	.14	.24	.29	.30	.31	.23	.21	.17	.20	.20	.22
INQ 14	.21	.30	.18	.27	.17	.35	.27	.17	.35	.18	.30	.35	.39	.40	.34	.26	.21	.19	.28	.2
INQ 15	.19	.28	.16	.22	.14	.33	.22	.14	.33	.17	.23	.33	.34	.35	.28	.20	.20	.16	.28	.22
BSS 1	.19	.16	.12	.17	.11	.34	.17	.11	.34	.21	.21	.29	.36	.38	.22	.26	.18	.19	.20	.21
BSS 2	.23	.21	.18	.23	.19	.37	.23	.19	.37	.27	.22	.29	.41	.36	.25	.27	.24	.25	.26	.27
BSS 3	.19	.13	.02	.12	.08	.20	.12	.08	.20	.17	.15	.14	.24	.18	.04	.08	.15	.10	.14	.13
BSS 4	.13	.16	.07	.13	.11	.23	.13	.11	.23	.21	.17	.22	.22	.29	.26	.23	.10	.17	.08	.11
BSS 5	.13	.17	.16	.12	.09	.17	.12	.09	.17	.18	.14	.21	.30	.26	.21	.26	.17	.19	.18	.18

Note. All correlations listed were significant at ($p < .01$). P = PTSD Checklist for *DSM-5*; INQ = Interpersonal Needs Questionnaire; BSS = Beck Suicide Scale.

Table B5

Bivariate Correlations Between Items of the Interpersonal Needs Questionnaire and Beck Suicide Scale

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. INQ 1	1.00																			
2. INQ 2	.93	1.00																		
3. INQ 3	.90	.87	1.00																	
4. INQ 4	.90	.91	.83	1.00																
5. INQ 5	.82	.88	.78	.87	1.00															
6. INQ 6	.81	.79	.82	.71	.70	1.00														
7. INQ 7	.29	.31	.26	.31	.30	.26	1.00													
8. INQ 8	.38	.39	.37	.37	.36	.42	.66	1.00												
9. INQ 9	.29	.25	.26	.25	.26	.30	.21	.26	1.00											
10.INQ 10	.28	.30	.26	.30	.28	.31	.63	.67	.26	1.00										
11.INQ 11	.48	.45	.46	.41	.45	.51	.22	.49	.43	.37	1.00									
12.INQ 12	.46	.44	.44	.38	.41	.51	.21	.50	.41	.33	.84	1.00								
13.INQ 13	.27	.28	.21	.26	.29	.27	.55	.61	.28	.71	.34	.30	1.00							
14.INQ 14	.35	.35	.35	.35	.34	.38	.60	.69	.33	.73	.46	.41	.81	1.00						
15. INQ 15	.32	.31	.33	.30	.31	.34	.53	.65	.31	.71	.41	.35	.75	.82	1.00					
16. BSS 1	.45	.50	.47	.51	.41	.42	.26	.31	.17	.30	.33	.29	.23	.27	.29	1.00				
17. BSS 2	.61	.55	.61	.58	.52	.55	.22	.30	.17	.24	.36	.33	.16	.26	.29	.53	1.00			
18. BSS 3	.39	.42	.39	.43	.31	.34	.16	.25	.13	.20	.27	.26	.14	.19	.20	.44	.46	1.00		
19. BSS 4	.46	.45	.46	.51	.39	.47	.18	.23	.16	.21	.23	.17	.18	.26	.20	.40	.46	.43	1.00	
20. BSS 5	.34	.36	.36	.39	.35	.30	.17	.18	.14	.16	.24	.16	.16	.20	.17	.36	.40	.17	.38	1.00

Note. All correlations listed were significant at ($p < .01$). INQ = Interpersonal Needs Questionnaire; BSS = Beck Suicide Scale.

Table B6

Standardized and Unstandardized Covariance Estimates for the Full Measurement Models.

Covariance Estimated	Estimate /S.E. (p-value)	95 % CI	STDYX (p-value)	95 % CI
PB with Rxp	0.41 / 0.05 (p < .01)	(0.30 - 0.49)	.50 (p < .01)	(.35 - .55)
PB with Avoid	0.32 / 0.06 (p < .01)	(0.20 - 0.41)	.37 (p < .01)	(.24 - .48)
PB with NACM	0.31 / 0.04 (p < .01)	(0.23 - 0.38)	.57 (p < .01)	(.47 - .66)
PB with Anhedonia	0.61 / 0.04 (p < .01)	(0.32 - 0.53)	.68 (p < .01)	(.59 - .76)
PB with Anx arousal	0.43 / 0.06 (p < .01)	(0.32 - 0.53)	.49 (p < .01)	(.37 - .59)
PB with Dys arousal	0.53 / 0.05 (p < .01)	(0.44 - 0.61)	.60 (p < .01)	(.50 - .68)
PB with Gender	0.02 / 0.03 (p = .79)	(-0.15 - 0.16)	.02 (p = .79)	(-.14 - .17)
TB with Rxp	0.23 / 0.03 (p < .01)	(0.17 - 0.29)	.35 (p < .01)	(.26 - .43)
TB with Avoid	0.24 / 0.04 (p < .01)	(0.16 - 0.30)	.36 (p < .01)	(.26 - .45)
TB with NACM	0.21 / 0.02 (p < .01)	(0.15 - 0.25)	.50 (p < .01)	(.41- .57)
TB with Anhedonia	0.42 / 0.03 (p < .01)	(0.36 - 0.48)	.63 (p < .01)	(.55 - .69)
TB with Anx arousal	0.43 / 0.06 (p < .01)	(0.21 - 0.35)	.63 (p < .01)	(.32 - .51)
TB with Dys arousal	0.36 / 0.03 (p < .01)	(0.30 - 0.42)	.53 (p < .01)	(.45 - .60)
TB with Gender	-0.03 / 0.05 (p = .58)	(-0.13 - 0.06)	-.04 (p = .80)	(-.23 - .20)
TB with PB	0.51 / 0.03 (p < .01)	(0.45 - 0.56)	.73 (p < .01)	(.63 - .77)
P-SI with Rxp	0.34 / 0.06 (p < .01)	(0.22 - 0.44)	.43 (p < .01)	(.28 - .54)
P-SI with Avoid	0.31 / 0.07 (p < .01)	(0.18 - 0.42)	.39 (p < .01)	(.22 - .53)
P-SI with NACM	0.28 / 0.05 (p < .01)	(0.19 - 0.36)	.57 (p < .01)	(.44 - .68)
P-SI with Anhedonia	0.53 / 0.06 (p < .01)	(0.40 - 0.63)	.64 (p < .01)	(.52 - .74)
P-SI with Anx arousal	0.40 / 0.07 (p < .01)	(0.24 - 0.50)	.46 (p < .01)	(.30 - .60)
P-SI with Dys arousal	0.45 / 0.06 (p < .01)	(0.23 - 0.54)	.54 (p < .01)	(.34 - .65)
P-SI with Gender	-0.06 / 0.10 (p = .56)	(-0.24 - 0.10)	-.06 (p = .56)	(-.26 - .10)
P-SI with PB	0.78 / 0.05 (p < .01)	(0.66 - 0.86)	.86 (p < .01)	(.80 - .91)

(continued)

Covariance Estimated	Estimate /S.E. (p-value)	95% CI	STDYX (p-value)	95% CI
P-SI with TB	0.44 / 0.04 (p < .01)	(0.49 - 0.80)	.65 (p < .01)	(.57 - .72)
Rxp with Avoid	0.70 / 0.03 (p < .01)	(0.64 - 0.73)	.89 (p < .01)	(.85 - .92)
Rxp with NACM	0.40 / 0.04 (p < .01)	(0.31 - 0.45)	.79 (p < .01)	(.74 - .83)
Rxp with Anx arousal	0.66 / 0.03 (p < .01)	(0.60 - 0.71)	.82 (p < .01)	(.77 - .86)
Rxp with Dys arousal	0.57 / 0.03 (p < .01)	(0.50 - 0.62)	.71 (p < .01)	(.64 - .76)
Rxp with Gender	-0.05 / 0.07 (p = .93)	(-0.14 - 0.01)	-.01 (p = .93)	(-.15 - .12)
Rxp with Anhedonia	0.57 / 0.04 (p < .01)	(0.50 - 0.63)	.71 (p < .01)	(.63 - .77)
Avoid with NACM	0.40 / 0.04 (p < .01)	(0.31 - 0.45)	.81 (p < .01)	(.75 - .86)
Avoid with Anx arousal	0.53 / 0.04 (p < .01)	(0.45 - 0.53)	.68 (p < .01)	(.60 - .74)
Avoid with Dys arousal	0.49 / 0.04 (p < .01)	(0.31 - 0.56)	.59 (p < .01)	(.50 - .66)
Avoid with Gender	0.16 / 0.07 (p = .03)	(-0.01 - 0.23)	.14 (p = .07)	(-.01 - .27)
Avoid with Anhedonia	0.51 / 0.06 (p < .01)	(0.43 - 0.58)	.68 (p < .01)	(.56 - .73)
NACM with Anx arousal	0.36 / 0.04 (p < .01)	(0.28 - 0.52)	.72 (p < .01)	(.65 - .77)
NACM with Dys arousal	0.40 / 0.04 (p < .01)	(0.32 - 0.46)	.79 (p < .01)	(.74 - .84)
NACM with Gender	0.02 / 0.04 (p = .53)	(-0.06 - 0.10)	.05 (p = .53)	(-.11 - .19)
NACM with Anhedonia	0.42 / 0.04 (p < .01)	(0.34 - 0.50)	.85 (p < .01)	(.80 - .90)
Anx arousal with	0.66 / 0.04 (p < .01)	(0.59 - 0.71)	.80 (p < .01)	(.75 - .85)
Dys arousal				
Anx arousal with Gender	0.14 / 0.08 (p = .37)	(-0.01 - 0.29)	.16 (p = .37)	(-.01 - .33)
Anx arousal with Anhedonia	0.57 / 0.04 (p < .01)	(0.49 - 0.63)	.70 (p < .01)	(.62 - .76)
Dys arousal with Gender	-0.06 / 0.07 (p = .38)	(-0.20 - 0.05)	-.07 (p = .80)	(-.22 - .05)
Dys arousal with Anhedonia	0.75 / 0.03 (p < .01)	(0.69 - 0.80)	.91 (p < .01)	(.87 - .94)
Gender with Anhedonia	-0.06 / 0.07 (p = .22)	(-0.02 - 0.33)	-.06 (p = .09)	(-.27 - .04)

Note. CI = confidence interval; PB = perceived burdensomeness; TB = thwarted belongingness; P-SI = passive suicidal ideation, desire and intent; Rxp = reexperiencing; Avoid = avoidance; Anx arousal = anxious arousal; Dys arousal = dysphoric arousal.

*p ≤ .05.

Table B7

Standardized and Unstandardized Parameter Estimates for the Full Structural Model

Path Estimated	Estimate /S.E. (p-value)	STDYX (p-value)
PB on Gender	0.28 / 0.15(p = .06)	.12 (p = .07)
TB on Gender	0.06 / 0.11 (p = . 59)	.03 (p = .57)
P-SI on Gender	-0.16 / 0.103(p = .24)	-.08 (p = .23)
PB on Reexperiencing	0.25 / 0.32 (p = .43)	.22 (p = .43)
TB on Reexperiencing	-0.41 / 0.21 (p = .06)	-.47 (p = .06)
P-SI on Reexperiencing	-0.27 / 0.25 (p = .39)	-.27 (p = .35)
PB on Avoidance	-0.55 / 0.29 (p = .06)	-.48 (p = .06)
TB on Avoidance	0.16 / 0.20 (p = .41)	.19 (p = .40)
P-SI on Avoidance	0.18 / 0.27 (p = .48)	.18 (p = .49)
PB on NACM	0.30/ 0.39 (p = .45)	.17 (p =.45)
TB on NACM	-0.20 / 0.24 (p = .41)	-.15 (p = 41)
P-SI on NACM	0.17 / 0.35 (p = .62)	.10 (p = .63)
PB on Anxious Arousal	0.21 / 0.25 (p = .40)	.20 (p = .40)
TB on Anxious Arousal	0.29 / 0.14 (p = .-04)	.35 (p = .04)
P-SI on Anxious Arousal	0.13 / 0.25 (p = .59)	.13 (p = .60)
PB on Dysphoric Arousal	-0.47 / 0.31 (p = .12)	-.44 (p = .12)
TB on Dysphoric Arousal	-0.31 / 0.20 (p < .01)	-.37 (p = .13)
P-SI on Dysphoric Arousal	-0.15 / 0.31 (p = .62)	-.16 (p = .61)
PB on Anhedonia	1.06 / 0.30 (p <.01)	.96 (p <.01)
TB on Anhedonia	0.88 / 0.21 (p <.01)	1.07 (p < .01)
P-SI on Anhedonia	0.11 / 0.31 (p = .72)	.11 (p = .72)
P-SI on PB	0.72 / 0.10 (p <.01)	.78 (p <.01)
P-SI on TB	0.05 / 0.12 (p = .69)	.04 (p = .69)
NACM with Gender	0.01 / 0.01 (p = .54)	.03 (p = .54)
NACM with Anhedonia	0.40 / 0.04 (p < .01)	.03 (p < .01)
NACM with Dysphoric Arousal	0.40 / 0.05 (p <.01)	.80 (p <.01)

(continued)

Path Estimated	Estimate /S.E. (p-value)	STDYX (p-value)
NACM with Reexperiencing	0.39 / 0.04 (p <.01)	.79 (p < .01)
NACM with Avoidance	0.39 / 0.04 (p <.01)	.81 (p < .01)
NACM with Anxious Arousal	0.36 / 0.04 (p <.01)	.72 (p < .01)
Gender with Dysphoric Arousal	-0.02 / 0.02 (p = .37)	-.05 (p = .37)
Gender with Anhedonia	-0.03 / 0.02 (p = .22)	-.08 (p = .21)
Gender with Reexperiencing	-0.01 / 0.02 (p = .93)	-.01 (p = .93)
Gender with Avoidance	0.04 / 0.02 (p = .07)	.11 (p = .07)
Gender with Anxious Arousal	-0.03 / 0.02 (p = .54)	-.05 (p = .42)
Anhedonia with Reexperiencing	0.57 / 0.04 (p <.01)	.71 (p < .01)
Anhedonia with Avoidance	0.51 / 0.04 (p <.01)	.65 (p < .01)
Anhedonia with Anxious Arousal	0.53 / 0.04 (p <.01)	.70 (p < .01)
Dysphoric Arousal with Reexperiencing	0.57 / 0.03 (p <.01)	.71 (p < .01)
Dysphoric Arousal with Avoidance	0.47 / 0.04 (p <.01)	.59 (p < .01)
Dysphoric Arousal with Anxious Arousal	0.66 / 0.03 (p <.01)	.80 (p < .01)
Reexperiencing with Avoidance	0.68 / 0.03 (p <.01)	.89 (p < .01)
Reexperiencing with Anxious Arousal	0.66 / 0.03 (p <.01)	.82 (p < .01)
Avoidance with Anxious Arousal	0.50 / 0.04 (p <.01)	.68 (p < .01)
PB with TB	0.18 / 0.04 (p <.01)	.48 (p < .01)

Note. PB = perceived burdensomeness; TB = thwarted belongingness; P-SI = passive suicidal ideation; NACM = negative alterations in cognitions and mood.

Table B8

Fit Statistics for Models Including Single PTSD Symptom Clusters.

PTSD Symptom Cluster Included	χ^2 (p-value)	Degrees of Freedom	RMSEA Estimate (90% CI)	CFI	TLI	R^2 (TB)	R^2 (PB)	R^2 (P-SI)
Reexperiencing	765.16 ($p \leq .01$)	289	.07 (.06-.07)	.98	.98	.12	.21	.24
Avoidance	680.64 ($p \leq .01$)	220	.07 (.07-.08)	.99	.99	.14	.13	.75
NACM	753.88 ($p \leq .01$)	265	.07 (.06-.07)	.98	.99	.24	.33	.76
Anhedonia	750.99 ($p \leq .01$)	242	.07 (.06-.08)	.99	.99	.40	.47	.75
Dysphoric Arousal	789.45 ($p \leq .01$)	265	.07 (.07-.08)	.99	.98	.30	.38	.75
Anxious Arousal	717.08 ($p \leq .01$)	220	.08 (.07-.08)	.99	.98	.18	.24	.75

Note. RMSEA = root mean square error of approximation; CFI = Bentler comparative fit index; TLI = Tucker-Lewis index; R^2 = coefficient of determination; NACM = negative alterations in cognitions and mood.

Table B9

Standardized and Unstandardized Parameter Estimates for Structural Models Containing Individual PTSD Symptom Clusters

Parameter Estimated	Reexperiencing Model		Avoidance Model		NACM Model		Anhedonia Model		Anxious Arousal Model		Dysphoric Arousal Model	
	Estimate (S.E.)	STDYX	Estimate (S.E.)	STDYX	Estimate (S.E.)	STDYX	Estimate (S.E.)	STDYX	Estimate (S.E.)	STDYX	Estimate (S.E.)	STDYX
PB on PTSD Sx Cluster	0.51 (0.06)*	.46	0.45 (0.07)*	.36	0.96 (0.13)*	.57	0.75 (0.05)*	.68	0.53 (0.08)*	.49	0.66 (0.05)*	.62
TB on PTSD Sx Cluster	0.30 (0.04)*	.35	0.36 (0.05)*	.36	0.65 (0.08)*	.50	0.54 (0.04)*	.63	0.35 (0.05)*	.42	0.46 (0.04)*	.55
P-SI on PTSD Sx Cluster	0.03 (0.07)	.03	0.09 (0.09)	.08	0.16 (0.14)	.10	0.07 (0.10)	.31	0.04 (0.08)	.04	0.02 (0.10)	.02
P-SI on PB	0.71 (0.01)*	.78	0.71 (0.09)*	.77	0.68 (0.10)*	.75	0.70 (0.10)*	.79	0.71 (0.01)*	.78	0.72 (0.01)*	.78
P-SI on TB	0.12 (0.10)	.10	0.10 (0.10)*	.09	0.10 (0.10)	.08	0.09 (0.11)	.07	0.10 (0.08)	.10	0.12 (0.11)	.10
TB with PB	0.40 (0.03)*	.64	0.42 (0.03)*	.64	0.31 (0.03)*	.57	0.19 (0.03)*	.46	0.36 (0.03)*	.61	0.27 (0.03)*	.54
PB on Gender	0.04 (0.14)	.02	-0.05 (0.14)	-.02	-0.01 (0.13)	-.01	0.16 (0.13)	.07	0.09 (0.13)	.03	0.11 (0.13)	.05
TB on Gender	-0.05 (0.09)	-.03	-0.12 (0.10)	-.07	-0.08 (0.08)	-.05	0.03 (0.08)	.01	-0.02 (0.09)	-.01	-0.02 (0.09)	.01
P-SI on Gender	-0.12 (0.12)	-.06	-0.14 (0.13)	-.07	-0.13 (0.12)	-.06	-0.11 (0.12)	-.05	-0.12 (0.12)	-.06	-0.12 (0.12)	-.06
Gender with PTSD Cluster	-0.01 (0.02)	-.01	0.03 (0.02)*	.10	0.01 (0.02)	.04	-0.03 (0.02)	-.08	-0.02 (0.02)	-.05	-0.02 (0.02)	-.06

Note. TB = thwarted belongingness; P-SI = passive suicidal ideation; PB = perceived burdensomeness; STDYX = standardized solution outputted by Mplus; S.E. = standard error; Sx = symptom. * $p \leq .05$. ** $p \leq .01$.

Table B10

Indirect Effects of Each PTSD Symptom Cluster on Suicidal Ideation Through Perceived Burdensomeness and Thwarted Belongingness.

PTSD Symptom Cluster Included	Specific Indirect Effect on P-SI through PB		Specific Indirect Effect on P-SI through TB	
	Estimate (95 % CI)	STDYX (95 % CI)	Estimate (95 % CI)	STDYX (95 % CI)
Reexperiencing	0.07 (0.00 – 0.14)	0.07* (0.01 – 0.13)	0.04 (0.00 – 0.11)	0.04 (-0.01 – 0.09)
Avoidance	0.32 (0.17 – 0.49)	0.28* (0.14 – 0.42)	0.03 (-0.05 – 0.11)	0.03 (-0.04 – 0.10)
NACM	0.66 (0.38 – 0.98)	0.43* (0.26 – 0.59)	0.06 (-0.10 – 0.20)	0.04 (-0.06 – 0.14)
Anhedonia	0.52 (0.33 – 0.72)	0.52* (0.34 – 0.69)	0.05 (-0.08 – 0.17)	0.05 (-0.08 – 0.18)
Dysphoric Arousal	0.47 (0.31 – 0.65)	0.47* (0.31 – 0.62)	0.05 (-0.05 – 0.15)	0.05 (-.05 – 0.15)
Anxious Arousal	0.38 (0.23 – 0.54)	0.38* (0.25 – 0.52)	0.04 (-0.04 – 0.18)	0.04 (-0.04 – 0.12)

Note. P-SI = passive suicidal ideation; PB = perceived burdensomeness; TB = thwarted belongingness; NACM = negative alterations in cognitions and mood.
* $p \leq .01$.

Table B11

Standardized and Unstandardized Parameter Estimates for the Full Path Model

Parameter Estimated	Estimate (S.E.)	STDYX (95% CI)
PB on PTSD	0.03 (0.01)*	.48
TB on PTSD	0.04 (0.01)*	.46
P-SI on PTSD	0.01 (0.01)	.12
P-SI on PB	0.30 (0.05)*	.29
P-SI on TB	0.26 (0.05)*	.33
TB with PB	0.35 (0.04)*	.36
PB on Gender	0.08 (0.10)	.04
TB on Gender	-0.08 (0.10)	-.03
P-SI on Gender	-0.19 (0.13)	-.08
Gender with PTSD	0.01 (0.35)	.01
Indirect Effect of PTSD on P-SI through PB	0.01 (0.01)*	.14 (.08-.20)
Indirect Effect of PTSD on P-SI through PB	0.01 (0.01)*	.15 (.10-.21)

Note. TB = thwarted belongingness; P-SI = passive suicidal ideation; PB = perceived burdensomeness; STDYX = standardized solution outputted by Mplus; S.E. = standard error; Sx = symptom.
* $p \leq .05$.

Appendix C: Item Mapping

Table C1

PCL-5 Item Mapping for Confirmatory Factor Analytic Models

PCL-5 Item	DSM-5 Criterion	DSM-5 PTSD Symptom Description	DSM-5 Model	Anhedonia Model
1	B1	Intrusive thoughts of trauma	R	R
2	B2	Recurrent dreams of trauma	R	R
3	B3	Flashbacks	R	R
4	B4	Emotional reactivity to trauma cues	R	R
5	B5	Physiological reactivity to trauma cues	R	R
6	C1	Avoiding thoughts of trauma	A	A
7	C2	Avoiding reminders of trauma	A	A
8	D1	Inability to recall aspects of trauma	N	N
9	D2	Distorted negative beliefs	N	N
10	D3	Distorted blame	N	N
11	D4	Negative trauma-related emotions	N	N
12	D5	Anhedonia	N	AN
13	D6	Detachment/estrangement from others	N	AN
14	D7	Constricted positive affect	N	AN
15	E1	Irritability	H	DA
16	E2	Self-destructive/ reckless behavior	H	DA
17	E3	Hypervigilance	H	AA
18	E4	Exaggerated startle response	H	AA
19	E5	Difficulty concentrating	H	DA
20	E6	Sleep disturbance	H	DA

Note. PCL-5= PTSD Checklist for *DSM-5*; R = reexperiencing; A = avoidance; N = negative alterations in cognitions and mood; H = hyperarousal; AN = anhedonia; DA = dysphoric arousal; AA = anxious arousal.

Table C2

Content Descriptors for All Items From the Interpersonal Needs Questionnaire and Beck Suicide Scale Used in Analyses.

Scale (Latent Factor)	Item Number	Item Content
INQ (Perceived Burdensomeness)		
	INQ item 1	Better off without me
	INQ item 2	Happier without me
	INQ item 3	Burden to society
	INQ item 4	Death as a relief
	INQ item 5	Rid of me
	INQ item 6	Make things worse
INQ (Thwarted Belongingness)		
	INQ item 7*	Others care about me
	INQ item 8*	Feel like I belong
	INQ item 9	Rarely interact with caring others
	INQ item 10*	Have caring/supportive friends
	INQ item 11	Feel disconnected
	INQ item 12	Feel like an outsider
	INQ item 13*	People I can turn to
	INQ item 14*	Close to others
	INQ item 15*	One satisfying interaction/day

(continued)

Scale (Latent Factor)	Item Number	Item Content
BSS (Passive Suicidal Ideation)		
	BSS item 1	Wish to live
	BSS item 2	Wish to die
	BSS item 3	Reasons for living (> for dying)
	BSS item 5	Passive desire for suicide
	BSS item 6	Length and duration of SI

Note. INQ = Interpersonal Needs Questionnaire; BSS = Beck Suicide Scale; * Denotes items that were reverse coded for analyses.