DISTINCTIVENESS OF AVOIDANCE AND NUMBING IN PTSD

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DISTINCTIVENESS OF AVOIDANCE AND NUMBING IN PTSD

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A Thesis

Submitted to

the Graduate Faculty of

Auburn University

in Partial Fulfillment of the

Requirements for the

Degree of

Master of Science

Auburn, Alabama
May 10, 2008

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May 10, 2008

Date of Graduation

THESIS ABSTRACT

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Master of Science, May 10, 2008
(B.A. Southwestern University, 2004)

67 Typed Pages

Directed by Frank W. Weathers

Although the avoidance and numbing symptoms of PTSD are grouped together on the same symptom cluster in DSM-IV-TR, studies of the PTSD symptom structure suggest they are distinct. Studies have validated the distinctiveness of avoidance and numbing by examining their differential correlations with external measures of psychopathology, especially depression. To date, no study has examined the incremental validity of avoidance and numbing with external measures of psychopathology. The current study examined the differential correlations of avoidance and numbing with depression, anxiety, dissociation, and a multi-scale measure of personality functioning in a sample of young adults from Auburn University who reported having experienced a traumatic event. Next, the incremental predictive utility of avoidance and numbing in account for scores on external measures of psychopathology was assessed after controlling for negative self-presentational style. Results replicated previous studies in finding that external measures of psychopathology were correlated more strongly with

numbing than with avoidance. Both avoidance and numbing exhibited incremental predictive utility beyond each other and beyond negative self-presentational style, supporting the hypothesis that avoidance and numbing are distinct processes and suggesting that avoidance and numbing should be separated in the DSM-V. Furthermore, the incremental predictive utility of numbing accounted for a greater proportion of the variance than avoidance and also contributed significantly to the prediction of more external correlates than did avoidance. These results emphasize the important role of numbing in PTSD.

ACKNOWLEDGEMENTS

Thank you to Dr. Frank Weathers for his supporting me in achieving my goals and for promoting the development of my thinking about trauma and PTSD. Thanks to Dr. Roger Blashfield for fostering critical thinking skills and encouraging me to consider how clinicians think about science and about people. Thanks to Dr. Adrian Thomas for his helpful assistance in understanding and interpreting the statistical methods used in this study. Thanks as well to all of the hard working graduate students and undergraduate research assistants who kept the research lab hopping and to the participants who shared their personal experiences. And finally, huge appreciation is due to all of the kind and generous family members, friends, and colleagues who provided me with emotional support throughout this process, especially my parents Mary Bethune and Robert Pruneau and my friends Jennifer Day, Ryan Harfield, and Beth Eckardt.

Style manual used:

Publication Manual of the American Psychological Association, 5th edition (2001)

Computer software used:

Microsoft Word 2007

Statistical Packages for the Social Sciences 16.0

TABLE OF CONTENTS

LIST OF TABLES

INTRODUCTION

Posttraumatic stress disorder (PTSD) is a mental disorder that may develop in response to experiencing an extreme stressor, such as a natural disaster, sexual assault, or combat. The diagnostic criteria for PTSD have evolved since it was first introduced in the *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed.; *DSM-III*; American Psychiatric Association [APA], 1980). The evolution of the criteria is a function of periodic revisions that aim to ensure that the content and structure of the diagnostic criteria best reflect current understanding of the core syndrome.

In the *DSM-III*, the PTSD diagnosis included 12 symptoms which were grouped into the three symptom clusters of reexperiencing, numbing, and miscellaneous symptoms. In the *DSM–III–R* (3rd ed., rev.; APA, 1987), the symptom criteria were expanded to 17 total symptoms and the symptoms clusters were reorganized. One of many changes was the combination of effortful avoidance and emotional numbing symptoms on one symptom cluster and the expansion of the symptom cluster to include avoidance of trauma-related thoughts or feelings and sense of a foreshortened future. In *DSM-III* and *DSM-III-R*, the diagnostic criteria for PTSD were based primarily on theoretical rationale and clinical observation.

The revision process for the *DSM-IV* (4th ed.; APA, 2000) incorporated empirical evidence with theoretical rationales in decisions about diagnostic criteria for PTSD (Kilpatrick, Resnick, Freedy, Pelcovitz, Resick, Roth, & van der Kolk, 1997). This effort

led to substantial revision to the definition of a traumatic event, but resulted in few changes to the content and organization of the symptoms themselves. Therefore, the criteria for a diagnosis of PTSD appear to have stabilized in their current form, which require exposure to a traumatic event (cluster A criteria), reexperiencing symptoms (e.g., intrusive memories, nightmares; cluster B criteria), avoidance and numbing symptoms (e.g., avoiding thoughts of the trauma, restricted range of affect; cluster C criteria), and hyperarousal symptoms (e.g., problems sleeping, hypervigilance; cluster D criteria). Additional criteria are that the symptoms have occurred for more than one month (cluster E criterion) and that they cause clinically significant distress or impairment (cluster F criterion).

Despite the increased use of empirical evidence in defining PTSD, there remain questions about the validity of the current symptom structure. In particular, the *DSM-IV* symptom structure was not based on studies examining structural validity of the diagnosis. Accordingly, researchers conducted factor analytic studies to determine whether the underlying factors of PTSD symptoms in various samples were consistent with the underlying dimensions of PTSD implied by the three symptom clusters. Overwhelmingly, these studies have failed to support the *DSM-IV* structure of PTSD, thus challenging the current arrangement of symptoms and suggesting that it may not be an accurate representation of the underlying mechanisms of PTSD. One of the most consistent findings across these studies is that effortful avoidance and emotional numbing symptoms may not belong on the same symptom cluster (for a review, see Asmundson, Stapleton, & Taylor, 2004).

Effortful avoidance and emotional numbing symptoms of PTSD are combined on cluster C in the *DSM*. The avoidance criteria are persistent efforts to (C1) avoid thoughts, feelings, or conversations associated with the trauma and (C2) avoid activities, places, or people that are associated with the trauma. These symptoms involve the conscious and strategic avoidance of reminders of the trauma that are present within the person and that are coming from their environment. The numbing criteria are (C3) inability to recall an important aspect of the trauma, (C4) markedly diminished interest or participation in significant activities, (C5) feeling of detachment or estrangement from others, (C6) restricted range of affect, and (C7) sense of a foreshortened future. Conceptually, symptoms C4 through C6 are considered to be the core emotional numbing symptoms (Litz, 1992). To be diagnosed with PTSD, at least three of the seven Cluster C symptoms must be present.

Avoidance and numbing may have been combined on the same symptom cluster because they are both deficit symptoms of PTSD. For example, they are both characteristic of Horowitz's (1986) denial phase of trauma. Additionally, they share the function of providing escape from the aversive reexperiencing symptoms of PTSD (Foa, Zinbarg, & Rothbaum, 1992). Despite these similarities between avoidance and numbing, theoretical accounts of these symptoms have described them as qualitatively distinct processes. For example, avoidance behaviors are conceptualized as an operant process, whereas emotional numbing is conceptualized as an automatic biological process (Foa, Zinbarg, & Rothbaum, 1992).

Theories of Effortful Avoidance and Emotional Numbing

Effortful avoidance. Mowrer's (1960) two-factor learning theory is a parsimonious and widely accepted model for the reexperiencing and effortful avoidance symptoms of PTSD (Litz & Gray, 2002, Cahill & Foa, 2007). In this model, the aversive traumatic event is considered to be an unconditioned aversive stimulus that elicits an unconditioned response of fear. During the trauma, classical conditioning occurs in which various stimuli in the environment become associated with the aversive unconditioned stimulus of the trauma, such that the environmental stimuli become conditioned to elicit fear and anxiety. The second step of this model is the operant conditioning step, in which avoidance of trauma cues is negatively reinforced by the decrease in anxiety.

Extending the conditioning model of PTSD into the domain of cognitions, emotional processing theory suggests that traumatic experiences lead to the development of pathological fear structures in memory (Foa & Kozak, 1985). These fear structures are the connection between feared stimuli, fear responses, and the attributed meaning of these stimuli and responses. When stimuli in the environment match elements in the fear structure, the structure is activated, thus setting off the wide range of meanings (e.g., the world is dangerous) and fear responses (e.g., fear, anxiety, avoidance). It is suggested that individuals with PTSD have fear structures in which a wide and generalized set of harmless environmental stimuli are associated with conditioned fear responses and with an attributed meaning of danger. This accounts for the reexperiencing and hyperarousal symptoms of PTSD because when environmental stimuli from this wide set of harmless stimuli are encountered, intrusive and distressing memories of the trauma will be

experienced and the person will experience a physiological fear response. The two-factor theory of fear conditioning then accounts for the reexperiencing and hyperarousal symptoms, in that the wide ranging elements (stimuli and meanings) that are part of the fear structure are likely to be avoided in order to avoid the fear response.

Emotional numbing. Conceptualizations of emotional numbing symptoms in PTSD have proposed that the restricted range of emotional reactions may result from an automatic analgesic response to uncontrollability over aversive stimulation in the environment (Van der Kolk, Boyd, Krystal, & Greenburg, 1984; Foa, Zinbarg, & Rothbaum, 1992) or a decreased likelihood of experiencing and expressing positive emotions due to depletion of emotional resources during hyperarousal (Litz, 1992; Litz & Gray, 2002). However, the study of numbing has been complicated by difficulties in measurement and operational definition. Specifically, it is possible that the observed restriction in the range of affect characteristic of numbing is a function of disruptions in the domain of (1) behavior, such that chronic avoidance limits the amount of emotionally evocative stimuli in the environment; (2) attention, such that there is a deficit in attending to emotionally evocative stimuli; (3) inhibition, such that emotional responses to stimuli are felt but not expressed; and (4) depleted capacity, such that emotional resources are used up by the increased level of arousal and distress experienced during hyperarousal (Litz, 1992).

Litz (1992) proposed that people experiencing emotional numbing continue to have the ability to experience and express the full range of emotions, however top-down processes interfere with their likelihood of experiencing the full range of emotions. He

suggests the disruption in emotional processing can occur in two ways. One type of disruption is that during active reexperiencing and hyperarousal, the person will differentially attend to stimuli by having easier access to negative schemas and more difficult access to positive schemas, and therefore experience and express fewer positive emotions. Another type of disruption involves the development of inflexible assumptions that the world is unsafe and unpredictable, which could then increase the likelihood that the person would choose to inhibit emotional responses to positive events.

Animal models of PTSD have identified similarities between emotional numbing in humans and stress-induced analgesia in animals (Foa, Zinbarg, & Rothbaum, 1992). Specifically, both humans with PTSD and animals in conditions of inescapable and unpredictable shock display a numbing of general responsiveness and decrease in pain sensitivity. Given these parallels, it is hypothesize that opioid-mediated analgesia in animals is a comparable process to emotional numbing in PTSD. With respect to the relationship between effortful avoidance and emotional numbing, it is suggested that the numbing symptoms can be conceptualized as the shutting down of the emotional system when effortful avoidance has failed to provide relief.

Lab studies have supported Litz's (1992) model of numbing, finding that participants with PTSD are comparable to a control group in their physiological emotional responses to positive and negative stimuli, indicating a capacity to experience emotion (Litz, Kaloupek, Orsillo, & Weathers, 2000; Amdur, Larsen, & Liberzon, 2000; Spahic-Mihajlovic, Crayton, & Neafsey, 2005). Additionally, the PTSD group in the Spahic-Mihajlovic et al. (2005) study reported positive pictures to be non-arousing,

whereas they found negative pictures to be as arousing as the control groups did, supporting the theory that people with numbing symptoms may need stimuli to pass a higher threshold to experience positive emotions.

Empirical Evaluation of the Distinction between Avoidance and Numbing Symptoms

To empirically evaluate whether there is a distinction between avoidance and numbing, researchers have examined a variety of sources of validity evidence, including structural evidence, differential course, differential treatment effects, and differential correlates (Asmundson, Stapleton, & Taylor, 2004).

Internal validation of symptom structure. The internal validation of the PTSD symptom structure has been examined using exploratory and confirmatory factor analyses, as well as regression analyses of the relationships between the symptom clusters. Exploratory factor analysis (EFA) groups variables together to provide information to generate hypotheses about underlying processes; whereas confirmatory factor analysis (CFA) tests a hypothesized factor structure based on theory and the results of previous exploratory factor analyses (Tabachnick & Fidell, 2006). Therefore, an exploratory factor analysis of PTSD symptoms seeks to identify possible underlying factors and a confirmatory factor analysis seeks to test hypothesized factor structures.

Taken together, EFA and CFA studies have indicated that avoidance and numbing are distinct constructs (Asmundson, Stapleton, & Taylor, 2004). The statistical independence of avoidance and numbing symptoms has been replicated using this approach in several diverse samples. The distinction has been replicated across trauma types, in samples of combat veterans (King, Leskin, King, & Weathers, 1998; Amdur &

Liberzon, 2001), rape victims (Foa, Riggs, & Gershuny, 1995), medical patients (Asmundson, Frombach, McQuaid, Pedrelli, Lenix, & Stein, 2000), and a nationally representative sample with various trauma histories (McWilliams, Cox, & Asmundson, 2005).

Although the distinction of avoidance and numbing symptoms has been consistent across the CFA literature, the separate factors onto which these symptoms load has been mixed. Most studies find that there are four factors that underlie PTSD, though the content of these factors varies. Several studies found that the model receiving the best support split avoidance and numbing into separate clusters and otherwise retained the organization of the *DSM* (King, Leskin, King, & Weathers, 1998; McWilliams, Cox, & Asmundson; 2005; Asmundson, Stapleton, & Taylor, 2004; Shelby, Golden-Kreutz, & Andersen, 2005; Marshall, 2004; Palmieri & Fitzgerald, 2005). These studies found the four underlying factors of PTSD to be reexperiencing, avoidance, numbing, and hyperarousal. Investigators suggest that revisions to the *DSM* symptom structure should break apart avoidance and numbing and expand the number of avoidance criteria (Friedman, Resick, & Keane; 2007).

Several other studies found that the model receiving the best support separated avoidance and reconfigured the numbing and hyperarousal symptoms, grouping the numbing and non-fear based hyperarousal symptoms as a dysphoria factor and leaving the fear-based hyperarousal symptoms as a separate factor (Krause, Kaltman, Goodman, & Dutton, 2007; Simms, Watson, & Doebbeling, 2002; Baschnagel, O'Connor, Colder, & Hawk, 2005). These studies found the four underlying factors of PTSD to be

reexperiencing, avoidance, hyperarousal (including the fear-based hyperarousal symptoms of hypervigilance and exaggerated startle response), and dysphoria (adding sleep problems, irritability, and concentration problems to the traditional numbing symptoms).

Studies identifying a dysphoria factor suggest that revisions to the *DSM* symptom structure should break apart avoidance symptoms, reorganize numbing and hyperarousal symptoms to create dysphoria and hyperarousal clusters, and expand the number of avoidance and hyperarousal criteria. The dysphoria model of PTSD is consistent with Watson's tripartite quantitative hierarchical model of emotional disorders (2005) in which the mood and anxiety disorders are categorized based on their relative degrees of positive affectivity, negative affectivity, and hyperarousal. In this model, dysphoria is consistent with negative affectivity, and PTSD is composed of high negative affectivity, high hyperarousal, and low positive affectivity.

In studies conducting regression analyses on the PTSD symptom structure, there are strong indications that numbing symptoms are functionally related to hyperarousal symptoms. Hyperarousal symptoms accounted for variance in emotional numbing symptoms above and beyond other symptoms in samples of male combat veterans (Litz, Schlenger, Weathers, Caddell, Fairbank, & Lavange, 1997; Flack, Litz, Hseih, Kaloupek, & Keane, 2000), female sexual assault survivors (Feuer, Nishith, & Resick, 2005; Tull & Roemer, 2003), and women of Japanese descent with a history of interpersonal victimization (Yoshihama & Horrocks, 2005). Flack et al. (2000) found that this

relationship held true even after controlling for physiological indices of arousal and reactivity.

Numbing and hyperarousal symptoms were also correlated among children with a history of PTSD (Weems, Saltzman, Reiss, & Carrion, 2003), and hyperarousal symptoms at a first assessment were predictive of numbing symptoms one year later, even while controlling for other past and concurrent symptoms. This finding was confirmed and extended in a longitudinal study examining the relationships between symptom clusters over time, in a sample of young adults who were injured as a result of community violence (Schell, Marshall, & Jaycox, 2004). In this study, the best cross-lagged panel model of symptoms found that numbing was best predicted by past hyperarousal and numbing symptoms, and avoidance was best predicted by past hyperarousal, reexperiencing, and avoidance symptoms. Avoidance and numbing only contributed to future predictions of themselves, and not any other symptom clusters. These studies are consistent with the models of numbing suggesting numbing is a function of chronically high levels of negative affect and hyperarousal (Litz, 1992; Litz & Gray, 2002). These studies are also consistent with models of avoidance as a strategic response to reexperiencing symptoms (Foa, Zinbarg, & Rothbaum, 1992).

Differential course. Numbing is associated with more severe PTSD than other symptom clusters (Foa, Riggs, & Gershuny, 1995). Additionally, numbing rarely occurs in trauma-exposed individuals who do not have PTSD (Foa, Riggs, & Gershuny, 1995) and is one of the distinguishing features between PTSD and other anxiety disorders (Foa, Zinbarg, & Rothbaum, 1992). More so than other symptom clusters, numbing is uniquely

associated with negative outcomes, such as veterans' perceptions of having a poor relationship with their children (Ruscio, Weathers, King, & King, 2002), and victims of interpersonal violence having an increased likelihood of revictimization in the future (Krause, Kaltman, Goodman, & Dutton, 2006). Taken together, evidence suggests that numbing symptoms are associated with a more severe course of PTSD. This differential course supports the distinction between avoidance and numbing.

Differential treatment effects. Behavioral treatments of PTSD, based upon the conditioning models of avoidance, account for the treatment-responsiveness of avoidance, but are less able to predict the treatment responsiveness of numbing (Cahill & Foa, 2007). Explanations of the effects of exposure therapy on numbing symptoms have posited an indirect intervention, in which numbing may subsequently be reduced because of the effects of reduced avoidance (Salcioglu, Basoglu, & Livanou, 2007). Treatment outcome studies suggest that exposure therapy is more effective at treating avoidance symptoms than numbing symptoms (Taylor, Fedoroff, Koch, Thordarson, Fecteau, & Nicki, 2001; Taylor, Thordarson, Maxfield, Fedoroff, Lovell, & Ogrodniczuk, 2003). Additionally, a drug trial study found that sertraline (Zoloft) caused greater decrease in numbing and hyperarousal symptoms than avoidance symptoms (Davidson, Landerman, Farfel, & Clary, 2002). Evidence of the differential effects of treatment provides further indication that avoidance and numbing may be independent processes.

External correlates. Fewer studies have examined the discriminant validation of avoidance and numbing than have examined the internal structure of PTSD. Studies in

this area have primarily used bivariate correlation to provide external validity evidence, and have primarily examined differential relationships with depression.

Studies supporting that depression has a closer relationship with numbing than avoidance have been replicated in samples of United Nations peacekeepers (Asmundson, Stein, & McCreary, 2002; Taylor, Kuch, Koch, Crockett, & Passey, 1998), utility workers exposed to the World-Trade Center site (Palmieri, Weathers, Difede, & King, 2007), Cambodian refugees (Palmieri, Marshall, & Shell, 2007), and people who have experienced motor-vehicle accidents (Taylor, Fedoroff, Koch, Thordarson, Fecteau, & Nicki, 2001), interpersonal abuse (Johnson, Palmieri, Jackson, & Hobfoll, 2007), and a variety of traumas (Taylor, Thordarson, Maxfield, Fedoroff, Lovell, & Ogrodniczuk, 2003). Across all of these studies, depression was significantly correlated with both avoidance and numbing, providing convergent validity for both avoidance and numbing as constructs. Additionally, a stable pattern emerged in which depression was more strongly correlated with numbing than with avoidance, providing discriminant validity evidence that avoidance and numbing may be distinct.

It could be argued that the overlap between numbing and depression (e.g., loss of interest in activities) could account for this pattern. Due to this concern, studies have examined the relationship between depression and numbing in PTSD, finding that they are distinct constructs (Blanchard, Buckley, Hickling, & Taylor, 1998; Ramirez, Glover, Ohlde, Mercer, Goodnick, Hamlin, & Perez-Rivera, 2001). This finding was clearly demonstrated in a study which removed the overlapping items between depression and numbing and found that numbing had incremental validity beyond depression and

dissociation in accounting for PTSD severity (Feeny, Zoellner, Fitzgibbons, & Foa, 2000).

To date, a few studies have examined the correlations of avoidance and numbing with various other constructs, typically finding that external constructs have stronger correlations with numbing than with avoidance. This pattern was observed when measuring dissociation among combat veterans (Amdur & Liberzon, 2001), state and trait anger among World Trade Center utility workers (Palmieri, Weathers, Difede, & King, 2007), intimate relationship distress among combat veterans (Riggs, Byrne, Weathers, & Litz, 1998), decreased life satisfaction and health satisfaction among women who had experienced sexual harassment (Palmieri & Fitzgerald, 2005), psychophysiological measures of impairment in stimulus discrimination and attention (Felmingham, Bryant, Kendall, & Gordon, 2002) and resource loss (i.e., loss of material, energy, work, interpersonal, and family resources) among women with a history of interpersonal violence (Johnson, Palmieri, Jackson, & Hobfall, 2007). In the longitudinal study by Johnson et al. (2007), resource loss was associated with numbing symptoms 6 months previously (r = .42), but not with avoidance symptoms 6 months previously.

Studies examining the discriminant validity of avoidance and numbing indicate that they are differentially related to external constructs. However, these studies have used a limited number of external correlates, usually depression, which limits the interpretation of a pattern of external validity, particularly given the overlap between depression and numbing and the comorbidity between depression and PTSD. Existing research can therefore be extended through the use of a wide range of external constructs

within the same sample. An additional limitation to past research is that studies have mostly examined construct validity using bivariate correlations, which provide descriptive information towards external validation but do not directly test the independence of avoidance and numbing with respect to the external constructs. The statistical independence of avoidance and numbing can be tested directly by determining whether they both make a significant incremental contribution towards the prediction of external correlates.

Summary of Literature Review

The diagnostic criteria for PTSD have evolved in the past three decades based primarily upon theoretical rationales and, recently, the integration of empirical findings. As investigators have continued to test the current factor structure, it has become increasingly clear that the *DSM-IV* grouping of avoidance and numbing on cluster C is inconsistent with the factors underlying PTSD in a variety of samples. Confirmatory factor analyses have provided internal validity evidence demonstrating the statistical independence of avoidance and numbing across a wide range of samples.

The structural evidence that avoidance and numbing are likely distinct has been supported through several other lines of evidence, from differences in conceptual models, to differential treatment responsiveness, differential prognosis, and preliminary evidence of differential external correlates. However, the differential external correlates of avoidance and numbing have been understudied compared to the other lines of evidence, and additional research is needed to confirm the distinction of avoidance and numbing using this approach (Asmundson, Stapleton, & Taylor, 2004).

Current Study

The purpose of the current study was to examine the distinction between effortful avoidance and emotional numbing in PTSD by examining their discriminant validity with various external measures of psychopathology. Two types of analyses were conducted to identify whether avoidance and numbing are distinct. The first phase of data analysis involved examining whether a differential pattern of correlations emerged between avoidance and numbing and external measures of psychopathology, including: depression, anxiety, dissociation, and a multi-scale measure of personality and psychopathology.

Hypothesis 1. Given that previous studies found avoidance and numbing to be significantly correlated with depression and dissociation, it was hypothesized that in the current study both avoidance and numbing would be significantly correlated with external measures of psychopathology.

Hypothesis 2. Consistent with the overarching hypothesis of this study that avoidance and numbing are distinct, it was hypothesized that there would emerge a differential pattern of associations in the correlations of avoidance and numbing with other measures of psychopathology. Thus, it was expected that avoidance would be more strongly correlated with some measures (e.g., anxiety, alcohol problems) than would numbing, and conversely, that numbing would be more strongly correlated with some measures (e.g., depression, dissociation) than would avoidance.

The second phase of the study involved evaluating the incremental validity of avoidance and numbing using separate series of hierarchical multiple regressions. These

analyses were conducted to determine whether avoidance and numbing could account for any variance in the external measures of psychopathology after factoring out the participant's response bias (a common limitation of using self-report measures), as well as to determine whether avoidance could account for variability not accounted for by numbing, and vice versa.

Hypothesis 3. Consistent with the hypothesis that avoidance and numbing are distinct, it was hypothesized that numbing would show incremental predictive utility beyond avoidance in accounting for scores on external measures of psychopathology.

Hypothesis 4. Consistent with the hypothesis that avoidance and numbing are distinct, it was hypothesized that avoidance would show incremental predictive utility beyond numbing in accounting for scores on external measures of psychopathology.

METHOD

Participants

Participants were recruited by announcement through the extra credit system for students of any age in eligible undergraduate psychology courses. They self-identified with the announcement as having experienced "a very stressful event, such as a serious car accident, natural disaster (tornado, hurricane, and flood), physical or sexual assault, or similarly stressful event." All participants completed the first session in which they completed a battery of questionnaire measures. Some participants were also selected to return for a diagnostic interview, though these data were not used in the current study. The Auburn University Institutional Review Board approved the study.

Participants were 576 undergraduate students who completed the questionnaire session of the study as an optional activity for extra credit in psychology courses at Auburn University. Of these, 262 participants were excluded based upon the following criteria: participant's index event did not meet criterion A1 for a traumatic event (n = 174); participant did not endorse criterion A2 symptoms of experiencing fear, helplessness, or horror during or after their event (n = 10); participant's PAI profiles were presumed to be invalid due to random responding, carelessness, reading difficulty, confusion, or neglecting to follow instructions, measured by Infrequency scale scores ≥ 75 *T* or Inconsistency scale scores ≥ 73 *T* (n = 27; Morey, 1996); participant endorsed an additional event to their index event either on the PCL or on one of the other measures of PTSD symptoms administered prior to their completion of the PCL (n = 49); participant left more than 10% of a measure blank (n = 2). Therefore, the final sample for the current study consisted of 314 participants.

Participants were predominantly female (n = 232; 74%) and Caucasian (n = 255; 81%) or African American (n = 40; 13%). Participants' ages ranged from 17 to 36 years (M = 20.2; SD = 2.3 years). Most were full-time students (n = 302; 96%) and single (n = 295; 94%). The distribution in education status of participants was 37% in their freshman (n = 116), 21% in their sophomore (n = 66), 16% in their junior (n = 49), and 26% in their senior year (n = 80). All participants endorsed at least one event that met the two-part definition of a trauma in Criterion A of the *DSM-IV*.

Measures

Questionnaire packets were ordered such that participants first completed a demographic information form, followed by two measures of trauma exposure, a brief measure of distress related to the trauma, and then four measures of PTSD symptoms and seven measures of non-PTSD psychopathology. The PTSD measures and other measures were presented such that the longest measure (Personality Assessment Inventory) was always presented either first or last, and the PTSD measures were always separated by another measure. Within this structure, the PTSD and other measures were presented in random order to counterbalance order effects. Measures that were administered in the self-report measure battery that were not included in the current study were the Stressful Events Impact Form, the Life Threat and Betrayal Inventory (two measures developed by the researchers), the Cognitive Distortion Scale, the Inventory of Altered Self-Capacities, and the Trauma and Attachment Belief Scale.

Trauma exposure. Trauma history was assessed using the Life Events Checklist, (LEC; taken from the Clinician Administered PTSD Scale; Blake, Weathers, Nagy, Kaloupek, Gusman, Charney, & Keane, 1995). The LEC is a 17-item measure of stressful events (e.g., natural disaster, transportation accident, physical assault, sexual assault) on which participants report whether they have experienced, witnessed, or learned of any of these events during their lifetime. Next, participants identify the worst event (the one that has caused the most problems), and endorse items indicating whether that event meets DSM-IV-TR Criterion A1 (actual or threatened death or serious injury, or a threat to the physical integrity of self or others) and Criterion A2 (response of intense fear,

helplessness, or horror). The LEC also measures participant's age at the time of the traumatic event, and the number of times they experienced the event. Finally, participants provide a brief narrative of their worst event.

A research team composed of a doctoral level supervisor and three graduate students used an extensive coding system to determine whether an index event met Criterion A1 based on all information on the event reported in the participant's measures. Events with a mismatched code, in which one rater coded there was not enough information available and the other rater coded that the event was definite criterion A1 were submitted to further analysis with the doctoral level supervisor, and a consensus code was reached. Of seven such events, two were determined to be definite criterion A1 and five were determined to have not enough information available. Rater codes were then collapsed into either (1) definite criterion A1 or (2) other. Kappa coefficients for inter-rater reliability were computed with these codes (kappa = .801) indicating acceptable agreement. Only screening packets identified as meeting Criterion A1 by both raters (n = 400) or by subsequent consensus rating (n = 2), were included in the analyses; those identified as subthreshold Criterion A1, Not Criterion A1, and Not Enough Information were ineligible for inclusion in the study. Additional exclusion criteria as previously described were then applied, resulting in the final sample size of 314.

Up to three LEC codes were used to categorize the index events. Raters employed as many LEC codes as applied to the event described. Next, a consensus was reached by all three coders for a primary (and, if necessary, secondary) trauma code for each participant. Among the 314 participants who met all eligibility criteria, the primary

traumatic events experienced by participants were: transportation accident (23%, *n* = 73), sudden loss of a loved one (19%, *n* = 61), life-threatening illness or injury (12%, *n* = 36), sexual assault or other unwanted sexual experience (10%, *n* = 31), natural disaster (10%, *n* = 30), homicide or suicide (6%, *n* = 18), assault with a weapon (5%, *n* = 17), or physical assault (5%, *n* = 17). Additional primary events experienced were a serious accident at work or during recreation (*n* = 10), combat (*n* = 6), fire or explosion (*n* = 5), exposure to a toxic substance (*n* = 2), captivity (*n* = 1), or any other stressful experience (*n* = 7).

Participants had predominantly experienced the traumatic event directly (63%; *n* = 199), while the remainder had either witnessed the event (18%; *n* = 56) or learned of it (19%; *n* = 59). Participants reported that the index event occurred or began between the ages of 4 and 30 (*M* = 16; *SD* = 4.2), and that it had been between 0 and 300 months (*M* = 48, *SD* = 49 months) since the event first occurred. Participants who reported having experienced more than one event in their lifetimes (34%, *n* = 108) endorsed having experienced an average of 3.4 events (*SD* = 4). Nineteen participants (6%) were coded by raters as having experienced chronic trauma (e.g., several years of recurring sexual abuse during childhood).

Posttraumatic stress disorder. The PTSD Checklist (PCL; Weathers, Litz, Herman, Huska, & Keane, 1993) was used to measure symptoms of PTSD. The PCL is a self-report measure assessing each of the 17 DSM-IV-TR symptoms of PTSD. There are three versions of the PCL. The civilian and military version (PCL-C and PCL-M) are used when a specific traumatic event has not been identified. On the specific version

(PCL-S) used in the present study, respondents first identify an index event and then refer to this event as they complete the items. On all three versions of the PCL, participants indicate how much they were bothered by each PTSD symptom in the past month, using a five-point scale (1 = not at all to 5 = extremely).

The PCL can be used to measure PTSD as a continuous measure of symptoms severity (total scores between 17 and 85), or to ascribe PTSD diagnosis by treating any item rated as a 3 (moderately) or higher as an endorsed symptom, and following DSM-IV diagnostic rules for categorizing participants. Using these scoring rules, 10% of the sample were estimated to meet criteria for PTSD (n = 31). Using an alternative scoring rule of PCL scores greater than 40 as clinically significant, 15% of the sample (n = 47) were categorized as experiencing clinically significant symptoms.

Avoidance was measured by summing the scores of PCL item 6 ("Avoiding thinking about or talking about the stressful experience or avoiding having feelings related to it") and item 7 ("Avoiding activities or situations because they reminded you of the stressful experience"). These two items assess the severity of DSM-IV avoidance symptoms, with a possible range of scores between 2 and 10. Numbing was measured by summing scores of PCL items 8 through 12, which assess severity of DSM-IV numbing symptoms, with a possible range of scores between 5 and 25. This 5-item measure includes the three core numbing symptoms ("loss of interest in activities that you used to enjoy;" "feeling distant or cut off from other people;" "feeling emotionally numb or being unable to have loving feelings for those close to you"), as well as the two other DSM-IV numbing symptoms ("trouble remembering important parts of the stressful

experience;" "feeling as if your future somehow will be cut short"). Despite the differences in item length, both measures had comparable and acceptable reliabilities in the current study, with coefficient alphas of .763 for avoidance and .736 for numbing.

The PCL has been used extensively in a wide variety of trauma populations and has shown to possess excellent psychometric properties. PCL symptom ratings and Clinician Administered PTSD Scale scores exhibited a strong correlation (r = .929) in a sample who had experienced sexual assault or motor vehicle accident (Blanchard, Jones-Alexander, Buckley, & Forneris, 1996). Ruggiero, Ben, Scotti, and Rabalais (2003) examined the psychometric properties of the PCL in a sample of college students similar to the sample used in the present study. Their sample included a variety of index events, with the primary events being motor vehicle accident, sudden loss of a loved one, and natural disaster, consistent with the current study. PCL items had item-test correlations between .60 to .74 for cluster B symptoms, .39 to .74 for cluster C symptoms, and .63 to .76 for cluster D symptoms. Correlations between subscales ranged from .73 to .76. Internal consistency was high, with Cronbach alphas of .94 (total), .85 (cluster B), .85 (cluster C), and .87 (cluster D). Test-retest reliability was also high, with correlations of .92 at immediate re-test, .88 at one-week re-test, and .68 at two-week re-test.

Depression. The Beck Depression Inventory – Second Edition (BDI-II) is a 21-item measure of current symptoms of depression (e.g., sadness, loss of interest, changes in sleeping pattern; Beck, Steer, & Brown, 1996). Participants endorsed the degree to which they had been bothered by each symptom during the past two weeks on a scale of 0 to 3, for a possible total score between 0 and 63. Internal consistency was .92 in a

psychiatric outpatient sample and .93 in a college student sample; test-retest reliability in an outpatient sample was .93 (Beck, Steer, & Brown, 1996).

Anxiety. The Beck Anxiety Inventory (BAI; Beck & Steer, 1993) is a 21-item measure of anxiety symptoms (e.g., inability to relax, fear of losing control, heart racing). Participants endorsed the degree to which they had been bothered by each symptom during the past week on a scale of 0 (Not at All) to 3 (Severely), for a possible total score between 0 and 63. In a sample of outpatient clients with anxiety disorders, the BAI had high internal consistency (Cronbach alpha = .94) and acceptable test-retest reliability (r = .67) over 11 days (Fydrich, Dowdall, & Chambless, 1992).

Dissociation. The Dissociative Experiences Scale – Second Edition (DES-II) is a 28-item measure of participants' experiences of dissociation (e.g., feeling their body does not belong to them, feeling as though the world around them is not real; Bernstein & Putnam, 1986). The DES-II is a modified version of the original DES in which scores are rated on an 11-point Likert scale rather than a visual analog scale. For the DES-II, participants endorsed the percentage of the time that they had each experience on an 11-point scale (0% to 100% in increments of 10). Contrary to typical scoring rules, the DES-II responses were summed to create a total score rather than averaged. Carlson and Putnam (1993) found that the first edition of the DES demonstrated good psychometric properties in which test-retest reliability and internal reliability analyses ranged from .79 to .96, and .83 to .93, respectively.

Personality Assessment Inventory. The Personality Assessment Inventory (PAI; Morey, 1991) is a 344-item self-report measure designed to assess symptoms of a broad

range of psychopathology and personality traits. The PAI includes 22 non-overlapping scales: four validity scales to assess departures from conscientious responding and the tendency to present oneself in an overly negative or positive light; 11 clinical scales; 5 treatment scales; and 2 interpersonal scales. The PAI was standardized using three samples (normative, college student, clinical). The test-retest reliability of PAI subscales was greater than .8, and median internal consistency rates are reported to be .81 (normative group), .82 (college students), and .86 (clinical group). Clinical norms were used in the scoring of the current study.

The following PAI scales were used in the current study:

Negative Impression Management (NIM). To address concerns that participant response bias could confound the findings by accounting for elevated scores on all measures, the NIM scale was used as a measure of negative self-presentation to statistically control for response bias effects. The NIM scale is a 9-item validity scale that measures negative distortion in self-presentation. It includes items reflecting an exaggerated or distorted impression of the self and present circumstances and items that are bizarre and unlikely (Morey, 2003, pp. 49). These items have a relatively low endorsement rate in clinical samples.

Somatic Complaints (SOM). The SOM scale is a 24-item clinical scale measuring complaints and concerns about health and physical functioning. Elevations on this scale may indicate a belief that physical problems are a central problem in their life (Morey, 2003).

Anxiety (ANX). The ANX scale is a 24-item clinical scale measuring cognitive, affective, and physiological anxiety. Elevations on this scale may reflect a person who is frequently tense, worrying, and may be high-strung, nervous, timid, or dependent (Morey, 2003).

Anxiety-Related Disorders (ARD). The ARD scale is a 24-item clinical scale measuring symptoms of obsessive-compulsive disorder, specific phobias, and posttraumatic stress disorder. Elevations on this scale may indicate impairment and distress associated with specific fears, as well as maladaptive behavior patterns used to control anxiety (Morey, 2003). The *ARD Traumatic Stress* subscale is an 8-item subscale of ARD that measures 8 indicators of continuing distress resulting from a bad past experience. Four items assess re-experiencing of the event, one item measures avoidance of the event, one item measures numbing since the event, and two items are non-DSM correspondent measures of problematic response to trauma.

Depression (DEP). The DEP scale is a 24-item clinical scale measuring cognitive, affective, and physiological symptoms of depression. Elevations on this scale may indicate unhappiness, pessimism, self-doubt, dysphoria, hopelessness, and social withdrawal (Morey, 2003).

Mania (MAN). The MAN scale is a 24-item clinical scale measuring symptoms of a manic episode, including increased activity level, grandiosity, and irritability. Elevations on this scale may indicate a range of behaviors from ambition and being active and self-confident to impulsivity, restlessness, hostility, high energy levels, and lack of judgment (Morey, 2003).

Paranoia (PAR). The PAR scale is a 24-item clinical scale measuring symptoms of hypervigilance, persecution, and resentment. Elevations on this scale may indicate interpersonal mistrust and hostility (Morey, 2003).

Schizophrenia (SCZ). The SCZ scale is a 24-item clinical scale measuring unusual perceptions, social isolation, awkwardness in social interactions, and disorder in thoughts (e.g., confusion, concentration problems, disorganization of thought processes). Elevations may indicate unusual beliefs and perceptions, poor social competence, and disturbances in attention and concentration (Morey, 2003).

Borderline Features (BOR). The BOR scale is a 24-item clinical scale measuring affective instability, feelings of emptiness, self-harm, and a history of ambivalent, intense relationships in which one has felt exploited and betrayed (Morey, 2003).

Antisocial Features (ANT). The ANT scale is a 24-item clinical scale measuring features of psychopathy, such as a history of antisocial acts and involvement in illegal activities, egocentricity, and stimulus-seeking (Morey, 2003).

Alcohol Problems (ALC) and Drug Problems (DRG). The ALC and DRG scales are 12-item clinical scales measure a history of behaviors and consequences related to drug and alcohol use, abuse, and dependence (Morey, 2003).

Aggression (AGG). The AGG scale is an 18-item treatment consideration scale that measures control over anger and hostility, beliefs in the instrumental use of aggression, readiness to express anger to others, and the tendency to have physical displays of anger (Morey, 2003).

Suicidal Ideation (SUI). The SUI scale is a 12-item treatment consideration scale that measures thoughts of committing suicide. Moderate elevations may indicate periodic thoughts of self-harm and pessimism about the future, and severe elevations may indicate preoccupation with death and suicide as well as making steps toward suicide (Morey, 2003).

Stress (STR). The STR scale is an 8-item treatment consideration scale that measures life stressors, including problems in family relationships, finances, employment, and major life changes (Morey, 2003).

Nonsupport (NON). The NON scale is an 8-item treatment consideration scale that measures perceived lack of social support. Elevations on the NON scale may indicate few close interpersonal relationships or dissatisfaction in existing relationships (e.g., friends may be seen as unavailable when needed). Marked elevations may indicate the perception of little or no support system and a perception of others as uncaring and rejecting (Morey, 2003).

Treatment Rejection (RXR). The RXR scale is an 8-item treatment consideration scale that measures motivation for treatment. Elevations on the RXR scale suggest risk for treatment noncompliance, whereas very low scores may represent a "cry for help" (Morey, 2003, pp. 143).

Procedure

Data for this study were drawn from the data of large research protocol that included two phases. The first phase included a questionnaire packet of measures assessing participant self-report of demographics, characteristics of the traumatic event,

symptoms of posttraumatic stress disorder, personality functioning and emotional difficulties, anxiety, depression, dissociation, cognitive distortions, and trauma related cognitive schemas. The second phase included an interview, in which a graduate clinician administered the Clinician Administered PTSD Scale (CAPS; Blake, Weathers, Nagy, Kaloupek, Gusman, Charney, & Keane, 1995) with participants who met selection criteria.

The current study uses data only from the questionnaire session. Questionnaire sessions were conducted several times a week, with a maximum of 30 participants per session. Participants generally completed their questionnaires in 2 hours (range of 1.5 to 3 hours), and were compensated with documentation of 3 hours of participation to obtain extra credit in eligible undergraduate psychology courses. Sessions were conducted by one graduate and one or two undergraduate research assistants who provided participants with the questionnaire packet to complete.

Participants first read and signed the informed consent form and provided contact information for the diagnostic interview. Next, in order to minimize error, researchers stated that participants whose test scores indicated they followed the directions to the best of their ability (responding to the content of the items and not responding randomly) would be entered into a drawing for $15 (1 in 20 chance of winning). Researchers then instructed participants to complete the questionnaire packet while keeping in mind the same index event. When participants complete the questionnaire packet they submitted it to the researcher who reviewed it briefly for completion and ensured participants were not reporting suicidal plan or intent, and provided them with a debriefing form briefly

describing the purpose of the study and a list of mental health resources available in the community.

RESULTS

As noted earlier, the first phase examined whether there would be a differential pattern of association between avoidance and numbing and external measures of psychopathology. The associated hypotheses were explored by calculating the zero-order correlations between PCL subscales, the BDI-II, the BAI, the DES-II, and PAI clinical and treatment consideration scales. The second phase examined the incremental predictive utility of (1) avoidance, beyond numbing and participant negative response style, and (2) numbing, beyond avoidance and participant negative response style. To test the hypotheses associated with the second phase, a series of hierarchical regression analyses were conducted. Table 1 presents the means and standard deviations for all measures used in the current study. These scores were comparable to results reported in other studies using samples of trauma-exposed college students (e.g., Ruggiero, Ben, Scotti, & Rabalais, 2003; Flack, Milanak, & Kimble, 2005).

Correlations

Table 2 presents the zero-order correlations between the PCL total score, the PAI Negative Impression Management scale (NIM), the four subscales of the PCL, and all non-PTSD measures of psychopathology. Support was found for the first hypothesis, that avoidance and numbing would both be significantly correlated with external measures of psychopathology. Specifically, numbing was significantly correlated with the BDI-II, the BAI, the DES-II, and all clinical and treatment consideration scales of the PAI that were

examined, and avoidance was significantly correlated with the BDI-II, the BAI, the DES-II, 9 of the 12 clinical scales of the PAI that were examined, and all of the treatment consideration scales of the PAI.

To test for a statistical difference in the magnitude of the correlations between avoidance and numbing and external measures, the coefficients were transformed into a *z*-score using Fisher's *z* transformation, and then the *z*-scores were compared using the approach recommended for comparing correlated coefficients (Meng, Rosenthal, & Rubin, 1992). Based on these findings, support was found for the second hypothesis, that there would be a differential pattern of associations in the correlations between avoidance and numbing and the external correlates. There were several instances in which one of the external correlates had a significantly larger correlation with numbing than with avoidance; however, there were no instances in which an external correlate had a significantly stronger correlation with avoidance than numbing (see Table 6 for a summary of these findings).

Numbing exhibited a significantly larger correlation than did numbing with 14 of the 20 external measures. These correlates included the BDI-II, the BAI, the DES-II, the PAI clinical scales measuring somatic complaints, anxiety, depression, paranoia, schizophrenia, and borderline features, and alcohol problems, and the PAI treatment consideration scales of suicidal ideation, stress, nonsupport, and treatment rejection. For the other 6 external correlates (anxiety-related disorders, anxiety-related disorders traumatic stress subscale, mania, antisocial features, drug problems, and aggression) avoidance and numbing had comparable association strengths.

The least difference between two significant avoidance and numbing correlations occurred with the PAI anxiety related disorders traumatic stress subscale (ARD-T), which was also the strongest correlation of avoidance with any external correlate. The relatively stronger contribution of avoidance to this scale than to other PAI scales may be accounted for in part by the content of the ARD-T scale. The ARD-T subscale is composed primarily of reexperiencing items (4 reexperiencing items, 1 avoidance item, 1 numbing item, two non-*DSM* correspondent items), and avoidance and reexperiencing had the strongest correlation among PCL subscales (r = .612).

Incremental Validity

To test the incremental validity of avoidance and numbing in accounting for the external measures of psychopathology, two series of hierarchical regression analyses were conducted. In both series, the external measures of psychopathology presented in the preceding correlations (BDI-II, BAI, DES-II, PAI clinical and treatment consideration scales) served as the dependent variables. Analyses were not conducted for the antisocial features, alcohol problems, drug problems, and aggression scales of the PAI due to their weak and/or non-significant zero-order correlations with both avoidance and numbing that would make them unlikely to yield information about incremental validity.

To control for participant's negative self-presentational style (one type of response bias that could account for the correlations between avoidance and numbing and external measures of psychopathology), the PAI Negative Impression Management (NIM) scale was always entered as a first step in each analysis. In the series testing the incremental validity of avoidance, numbing was entered in the second step and avoidance

was entered in the third step. In the series testing the incremental validity of numbing, avoidance was entered in the second step and numbing was entered in the third step. Significant *F*-change values in the third step indicate a significant degree of incremental validity beyond the variables entered in the first two steps. Given the moderate correlations between NIM and avoidance (r = .355), NIM and numbing (r = .567), and avoidance and numbing (r = .571), collinearity diagnostics were evaluated for the two series of hierarchical regressions. No problematic levels of collinearity were identified, in that in no case did the variance inflation factor exceed 10 or the condition index exceed 30 (Tabachnick & Fidell, 2006).

Table 3 presents the results of the regression analyses conducted with the BDI-II, BAI, and DES-II as dependent variables. In the regressions presented on the left-hand side of Table 3, forced entry of numbing in the third step provided a test of the incremental validity of numbing beyond NIM and avoidance. Numbing significantly increased the prediction of BDI-II scores by 8.8% beyond the 44.0% already accounted for by NIM and avoidance ($F_{Chg}(1,310) = 57.6$, $p < .001$). Similarly, numbing significantly increased the prediction of BAI scores by 6.4% beyond the 29.1% already accounted for by NIM and avoidance ($F_{Chg}(1,310) = 30.7$, $p < .001$), and significantly increased the prediction of DES-II scores by 2.1% beyond the 32.9% already accounted for by NIM and avoidance ($F_{Chg}(1,310) = 10.2$, $p < .01$).

In the reverse models presented on the right-hand side of Table 3, forced entry of avoidance in the third step provided a test of the incremental validity of avoidance beyond NIM and numbing. Avoidance significantly increased the prediction of BAI

scores by 1.3% beyond the 34.3% already accounted for by NIM and numbing ($F_{Chg}(1,310) = 6.0$, $p < .05$), and significantly increased the prediction of DES-II scores by 1.3% beyond the 33.8% already accounted for by NIM and numbing ($F_{Chg}(1,310) = 6.2$, $p < .05$). Avoidance did not significantly increase the prediction of BDI-II scores already accounted for by NIM and numbing ($F_{Chg}(1,310) = 3.2$, *ns*).

Table 4 presents the results of these analyses conducted with selected PAI clinical scales as dependent variables. Again, the tests of the incremental validity of numbing are presented on the left-hand side of the table. Numbing evidenced significant incremental validity beyond NIM and avoidance on the following scales: Somatic Complaints ($F_{Chg}(1,310) = 27.0$, $p < .001$), Anxiety ($F_{Chg}(1,310) = 17.9$, $p < .001$), Anxiety-Related Disorders ($F_{Chg}(1,310) = 14.6$, $p < .001$), Anxiety-Related Disorders Traumatic Stress subscale ($F_{Chg}(1,310) = 20.1$, $p < .001$), Depression ($F_{Chg}(1,310) = 46.4$, $p < .001$), Mania ($F_{Chg}(1,310) = 4.0$, $p < .05$), Schizophrenia ($F_{Chg}(1,310) = 10.8$, $p < .01$), and Borderline Features ($F_{Chg}(1,310) = 14.1$, $p < .001$).

In the reverse models presented on the right-hand side of Table 4, avoidance evidenced significant incremental validity beyond NIM and numbing on the following scales: Anxiety ($F_{Chg}(1,310) = 5.5$, $p < .05$), Anxiety-Related Disorders ($F_{Chg}(1,310) = 19.2$, $p < .001$), Anxiety-Related Disorders Traumatic Stress subscale ($F_{Chg}(1,310) = 40.1$, $p < .001$), Mania ($F_{Chg}(1,310) = 4.0$, $p < .05$), and Borderline Features ($F_{Chg}(1,310) = 5.1$, $p < .05$). Avoidance did not exhibit significant incremental validity beyond NIM and numbing on the following scales: Somatic Complaints (F_{Chg} $(1,310) = 1.1$, *ns*),

Depression ($F_{Chg}(1,310) = 1.2$, *ns*), Paranoia ($F_{Chg}(1,310) = 2.3$, *ns*), and Schizophrenia ($F_{Chg}(1,310) = 0.2$, *ns*).

Table 5 presents the results of these analyses conducted with selected PAI treatment consideration scales as dependent variables. Numbing evidenced significant incremental validity beyond NIM and avoidance on the following scales: Suicidal Ideation ($F_{Chg}(1,310) = 33.6$, $p < .001$), Stress ($F_{Chg}(1,310) = 4.1$, $p < .05$), Nonsupport ($F_{Chg}(1,310) = 8.3$, $p < .01$), and Treatment Rejection ($F_{Chg}(1,310) = 16.9$, $p < .001$). In the reverse models avoidance did not evidence significant incremental validity beyond NIM and numbing.

A summary of the incremental validity of avoidance and numbing (as measured by change in R^2 and respective significance levels) across all measures are presented in Table 6. Numbing exhibited incremental validity beyond NIM and avoidance on the BDI-II, the BAI, the DES-II, and all but one PAI clinical and treatment consideration scales with which avoidance and numbing had been at least moderately correlated. The incremental predictive utility of numbing ranged from 0.7% (on the PAI paranoia scale) to 8.8% (on the BDI-II). Avoidance exhibited incremental validity beyond NIM and numbing on the BAI, the DES-II, and on 5 PAI clinical scales. The incremental predictive utility of avoidance ranged from 0% (on the PAI Schizophrenia scale) to 6.4% (on the PAI Anxiety-Related Disorders Traumatic Stress subscale).

In addition to these analyses, the entire series of hierarchical regressions was re-run with the addition in the fourth step of an avoidance and numbing interaction factor. The contribution of an interaction between avoidance and numbing was only significant

for one analysis, with the PAI Nonsupport scale as dependent variable. In the models testing both the incremental validity of numbing and that of avoidance, adding an avoidance/numbing interaction in the fourth step increased the R^2 by 0.9% (F_{Chg} (1,309) = 4.2, $p < .05$). This finding suggests that for the vast majority of the external correlates, the interaction of avoidance and numbing does not account for additional variance beyond NIM and their individual contributions. However, for participants' perceived lack of social support, the combined experience of avoidance and numbing accounts for a perceived lack of social support, even beyond that accounted for by NIM, and avoidance and numbing alone.

DISCUSSION

The purpose of the current study was to evaluate whether effortful avoidance and emotional numbing were distinct by examining their relationships with external correlates of psychopathology. There was a two-phase data analytic approach to answer this question. The first phase involved examining the pattern of correlations between avoidance and numbing and measures of depression, anxiety, dissociation, and a multi-scale measure of personality and psychopathology. The second phase involved testing the incremental validity of avoidance and numbing through a series of hierarchical multiple regression analyses, thus identifying if avoidance and numbing could independently account for the variance in external correlates beyond one another, and beyond participant response bias.

The first two hypotheses were addressed in the first phase of data analysis. The results supported the first hypothesis, that avoidance and numbing would both be

significantly correlated with external measures of psychopathology. Support was also found for the second hypothesis, which predicted that avoidance and numbing would exhibit a differential pattern of correlations with external measures of psychopathology. Replicating previous research (Asmundson et al., 2002, Palmieri et al., 2007, Taylor et al., 1998, Amdur & Liberzon, 2001), depression and dissociation were correlated more strongly with numbing than with avoidance.

Extending previous research, a differential pattern of correlations was found across a wide range of external measures of psychopathology. Notably, in all instances in which the correlation coefficients differed, numbing exhibited a larger correlation than did avoidance. The external correlates exhibiting the largest differences were measures of anxiety, somatic complaints, schizophrenia, borderline features, suicidal ideation, perceptions of lack of support, and motivation for treatment. In contrast, avoidance and numbing exhibited comparable correlations with a measure of anxiety-related disorders (with which they were both strongly correlated), with a measure of mania and aggression (with which they were both weakly correlated), and measures of antisocial features and drug problems (with which numbing was weakly correlated and avoidance was not correlated).

The third and fourth hypotheses were addressed in the second phase of data analysis. The results supported the third hypothesis that numbing would show incremental predictive utility beyond response bias and avoidance. Specifically, numbing exhibited significant incremental predictive utility across all but one external measure of personality and psychopathology. The variables towards which numbing made the

greatest incremental contribution were depression, suicidal ideation, anxiety, somatic complaints, motivation for treatment, and borderline features. The results also indicated support for the fourth hypothesis that avoidance would show incremental predictive utility beyond response bias and numbing. Avoidance made a significant incremental contribution towards anxiety-related disorders, anxiety-related disorders (traumatic stress subscale), anxiety, dissociation, mania, and borderline features.

The significant incremental predictive utility of avoidance and numbing identified in this study strongly support research literatures indicating that avoidance and numbing are distinct. If avoidance and numbing were not distinct in the current sample, then avoidance would not have added variance beyond the contributions made by numbing and participant response bias, and vice versa. The emergence of a pattern in which both avoidance and numbing exhibited incremental predictive utility for several measures of psychopathology (anxiety, dissociation, anxiety-related disorders, mania, and borderline features) provides strong evidence that they are distinct constructs. Therefore, the current study provides discriminant validity evidence for the separation of avoidance and numbing in the *DSM-V*. Additionally, it lays out some exploratory relationships between avoidance and numbing and external constructs that may direct future research efforts.

The incremental contributions of avoidance were not as large as were those of numbing. This may indicate that the external correlates selected for the current study overrepresented constructs that are related to numbing rather than avoidance. Or, given that numbing has been more strongly associated with external constructs in studies of differential correlates (e.g., Asmundson, Stein, & McCreary, 2002; Taylor, Kuch, Koch,

Crockett, & Passey, 1998; Taylor, Fedoroff, Koch, Thordarson, Fecteau, & Nicki, 2001; Palmieri, Weathers, Difede, & King, 2007; Riggs, Byrne, Weathers, & Litz, 1998), it is possible that numbing is a component of negative affectivity, as suggested by Watson (2005), and negative affectivity may also be a significant component of the external constructs that were measured, particularly those that measure constructs related to the emotional disorders.

Limitations and Future Directions

These results are restricted by the limitations of self-report measurement, such as the risk of participant response bias accounting for the results and the addition of error by individuals who did not follow instructions. We attempted to control for response bias by evaluating the incremental validity of avoidance and numbing beyond the variance from response bias. We attempted to minimize the effects of careless responding by excluding participants who exhibited response patterns that suggested responding without attention to item content. Nevertheless, it would be desirable for studies to examine the differential pattern of correlations of avoidance and numbing with external correlates using diverse methods of measurement, such as clinical interview, ratings of friends and family members, behavioral observation, and physiological indicators.

Given the exploratory nature of examining the incremental validity of avoidance and numbing in accounting for several external measures of psychopathology, a large number of regression series (n = 32) were conducted. The family alpha level of performing 32 analyses is .81, indicating that there is a high likelihood that some of the individual significant findings could be the result of a Type I error. The goal of the

current study was to interpret the pattern of results, rather than focus on any individual regression model, and the change in a few of the individual findings may not significantly change the pattern of results. However, it is important that the individual findings presented be interpreted with caution given this risk. The benefits of examining the incremental validity with several external measures was deemed necessary given the exploratory nature of the analyses; nevertheless, it is suggested that future studies examine the differential correlates of avoidance and numbing using design and statistical methods that reduce the number of analyses performed.

It is important to note that these findings were collected within a nonclinical sample, and therefore it is likely that these participants were relatively well-functioning compared to clinical samples. Given that there is evidence that PTSD is a dimensional disorder (Ruscio, Ruscio, & Keane, 2002), valuable information about the mechanisms of PTSD can be obtained from continuous measures of its underlying processes across the full range of symptom severity, including the relatively lower-severity sample of college students. With respect to the severe end of this continuum, there is evidence suggesting that the current sample included assessment of clinically relevant PTSD. Fifteen percent of the sample was judged to be experiencing clinically significant symptoms using a standard PCL cutoff, and 10% of the sample was estimated to meet all diagnostic criteria for PTSD. Additionally, during the diagnostic interview phase of the research protocol, several participants were judged by a clinical psychology graduate student to have met criteria for PTSD based on the CAPS and several participants disclosed participation in treatment for PTSD.

There was the potential for the two-item avoidance scale and the five-item numbing scale to confound results due to the likelihood that the avoidance scale would have poor reliability compared to the numbing scale, as a function of scale length. However, this was not a limitation of the current study as these measures were found to have very similar coefficient alphas. However, the two-item issue remains relevant to issues of classification and factor analysis studies of PTSD, because if the avoidance and numbing symptoms are separated, two items are likely unreliable for the adequate assessment of avoidance.

Overall, the clear finding of this study was that avoidance and numbing have distinct relationships with several external measures of psychopathology. This finding provides strong evidence that future research should ensure the separate measurement of avoidance and numbing, rather than aggregation across the symptom clusters for an overall symptom severity level. Additionally, it may be of value in clinical settings to assess and treat PTSD differently based upon the symptom presentation of the client (Watson, 2005). Based upon the measures with which avoidance and numbing provided incremental predictive utility, clients presenting with severe numbing may particularly benefit from screening for depression, suicidal ideation, somatic complaints, and borderline features, whereas clients presenting with severe avoidance may particularly benefit from screening for other anxiety disorders and dissociation.

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APPENDIX

Table 1
Descriptive Statistics for PCL, BDI-II, BAI, DES-II, and PAI

Measure	Items	Possible Range	Observed Range	*M*	*SD*
PCL Total	17	17-85	17-66	28.5	10.8
Reexperiencing	5	5-25	5-25	8.8	3.8
Avoidance	2	2-10	2-10	3.9	2.3
Numbing	5	5-25	5-24	7.3	3.3
Hyperarousal	5	5-25	5-25	8.5	3.8
BDI-II Total	21	0-63	0-40	10.0	8.5
BAI Total	21	0-63	0-55	10.2	10.1
DES-II Total	28	0-2800	2090	388.1	322.4
PAI Validity Scales					
NIM	9	44-110	44-92	51.0	9.4
PAI Clinical Scales					
SOM	24	39-110	39-94	51.5	9.1
ANX	24	34-103	35-100	56.3	11.6
ARD	24	26-110	28-100	55.2	11.9
ARD – T	8	41-99	41-99	57.3	13.3
DEP	24	35-110	35-94	52.8	11.4
MAN	24	25-103	28-92	53.5	11.0
PAR	24	30-98	33-98	53.4	10.4
SCZ	24	32-110	32-90	50.4	11.4
BOR	24	32-104	32-89	55.8	11.2
ANT	24	36-110	38-96	56.0	11.7
ALC	12	41-105	41-102	54.0	12.0
DRG	12	42-110	42-96	50.9	10.5
PAI Treatment Scales					
AGG	18	32-97	32-89	50.7	11.5
SUI	12	43-109	43-109	49.6	10.3
STR	8	37-91	37-89	51.5	9.4
NON	8	37-102	37-86	47.3	10.0
RXR	8	20-72	23-72	50.1	10.1

NOTE: $N = 314$.
PCL = Posttraumatic Stress Disorder Checklist; BDI-II = Beck Depression Inventory; BAI = Beck Anxiety Inventory; DES-II = Dissociative Experiences Scale; PAI = Personality Assessment Inventory; ICN = Inconsistency; INF = Infrequency; NIM = Negative Impression; PIM = Positive Impression; SOM = Somatic Complaints; ANX = Anxiety; ARD = Anxiety-Related Disorders; ARD-T = Traumatic Stress; DEP = Depression; MAN = Mania; PAR = Paranoia; SCZ = Schizophrenia; BOR = Borderline Features; ANT = Antisocial Features; ALC = Alcohol Problems; DRG = Drug Problems; AGG = Aggression; SUI = Suicidal Ideation; STR = Stress; NON = Nonsupport; RXR = Treatment Rejection.

Table 2
Correlations for PCL, NIM, BDI-II, BAI, DES-II, and PAI

Measure	NIM	Reexperiencing	Avoidance	Numbing	Hyperarousal
PCL					
Reexperiencing	.313**	-	-	-	-
Avoidance	.355**	.612**	-	-	-
Numbing	.567**	.503**	.571**	-	-
Hyperarousal	.513**	.600**	.494**	.601**	-
BDI-II	.618**	.396 **	.445**	.660**	.595**
BAI	.470**	.437**	.415**	.554**	.577**
DES-II	.534**	.298**	.386**	.492**	.339**
PAI Clinical Scales					
SOM	.498**	.237**	.250**	.490**	.458**
ANX	.581**	.395**	.408**	.547**	.610**
ARD	.530**	.514**	.478**	.544**	.584**
ARD – T	.575**	.586**	.565**	.607**	.585**
DEP	.666**	.416**	.414**	.641**	.594**
MAN	.382**	.187**	.193**	.166**	.231**
PAR	.583**	.369**	.323**	.441**	.393**
SCZ	.697**	.353**	.332**	.525**	.458**
BOR	.664**	.414**	.410**	.559**	.508**
ANT	.311**	.080	.093	.114*	.164**
ALC	.273**	.102	.039	.156**	.097
DRG	.189**	.109	.088	.112*	.121*
PAI Treatment Scales					
AGG	.301**	.113*	.128*	.185**	.212**
SUI	.517**	.257**	.273**	.523**	.360**
STR	.503**	.285**	.298**	.406**	.320**
NON	.523**	.297**	.257**	.426**	.331**
RXR	-.583**	-.258**	-.357**	-.525**	-.405**

* $p < .05$ ** $p < .01$
NOTE: $N = 314$.
PCL = Posttraumatic Stress Disorder Checklist; NIM = PAI Negative Impression Management; Reexperiencing = PCL Reexperiencing items; Avoidance = PCL Avoidance items; Numbing = PCL Numbing items; Hyperarousal = PCL Hyperarousal items; BDI-II = Beck Depression Inventory; BAI = Beck Anxiety Inventory; DES-II = Dissociative Experiences Scale; PAI = Personality Assessment Inventory; SOM = Somatic Complaints; ANX = Anxiety; ARD = Anxiety-Related Disorders; ARD-T = Traumatic Stress; DEP = Depression; MAN = Mania; PAR = Paranoia; SCZ = Schizophrenia; BOR = Borderline Features; ANT = Antisocial Features; ALC = Alcohol Problems; DRG = Drug Problems; AGG = Aggression; SUI = Suicidal Ideation; STR = Stress; NON = Nonsupport; RXR = Treatment Rejection.

Table 3

Hierarchical Regressions with NIM, Avoidance, and Numbing Predicting BDI-II, BAI, and DES-II Scores

Step	*B*	*SE*	*β*	R^2	ΔR^2	F_{change}	Reverse	*B*	*SE*	*β*	R^2	ΔR^2	F_{change}
Predicting BDI-II Scores													
Step 1				.381	.381	192.4***	Step 1				.381	.379	192.4***
NIM	.559	.040	.618				NIM	.559	.040	.618			
Step 2				.440	.058	32.3***	Step 2				.523	.141	92.0***
NIM	.476	.041	.526				NIM	.325	.043	.355			
Avoidance	.978	.172	.258				Numbing	1.187	.124	.456			
Step 3				.527	.088	57.6***	Step 3				.527	.005	3.2
NIM	.321	.043	.355				NIM	.321	.043	.355			
Avoidance	.321	.180	.085				Numbing	1.067	.141	.410			
Numbing	1.067	.141	.410				Avoidance	.321	.180	.085			
Predicting BAI Scores													
Step 1				.221	.221	88.3***	Step 1				.221	.221	88.3***
NIM	.506	.054	.470				NIM	.506	.054	.470			
Step 2				.291	.071	31.0***	Step 2				.343	.122	57.7***
NIM	.397	.055	.369				NIM	.247	.060	.229			
Avoidance	1.282	.230	.284				Numbing	1.313	.173	.424			
Step 3				.355	.064	30.7***	Step 3				.355	.013	6.0*
NIM	.240	.060	.223				NIM	.240	.060	.223			
Avoidance	.616	.251	.137				Numbing	1.083	.195	.350			
Numbing	1.083	.195	.350				Avoidance	.616	.251	.137			
Predicting DES-II Scores													
Step 1				.285	.285	124.5***	Step 1				.285	.285	124.5***
NIM	18.270	1.638	.534				NIM	18.270	1.638	.534			
Step 2				.329	.044	20.4***	Step 2				.338	.052	24.6***
NIM	15.541	1.700	.454				NIM	12.874	1.917	.376			
Avoidance	32.130	7.114	.224				Numbing	27.350	5.509	.278			
Step 3				.351	.021	10.2**	Step 3				.351	.013	6.2*
NIM	12.651	1.903	.370				NIM	12.651	1.903	.370			
Avoidance	19.873	7.988	.139				Numbing	19.925	6.226	.203			
Numbing	19.925	6.226	.203				Avoidance	19.873	7.988	.139			

*** $p < .001$ ** $p < .01$ * $p < .05$

Table 4

Hierarchical Regressions with NIM, Avoidance, and Numbing Predicting Select PAI Clinical Scales

Step	*B*	*SE*	*β*	R^2	ΔR^2	F_{change}	Reverse	*B*	*SE*	*β*	R^2	ΔR^2	F_{change}
Predicting Somatic Complaints													
Step 1				.248	.248	102.9***	Step 1				.248	.248	102.9***
NIM	.482	.048	.498				NIM	.482	.048	.498			
Step 2				.254	.006	2.5	Step 2				.312	.063	28.7***
NIM	.453	.051	.469				NIM	.314	.055	.325			
Avoidance	.337	.212	.083				Numbing	.851	.159	.306			
Step 3				.314	.060	27.0***	Step 3				.314	.002	1.1
NIM	.317	.055	.327				NIM	.317	.055	.327			
Avoidance	-.242	.232	-.060				Numbing	.941	.181	.338			
Numbing	.941	.181	.338				Avoidance	-.242	.232	-.060			
Predicting Anxiety													
Step 1				.337	.337	158.8***	Step 1				.337	.337	158.8***
NIM	.717	.057	.581				NIM	.717	.057	.581			
Step 2				.384	.047	23.6***	Step 2				.407	.070	36.7***
NIM	.615	.059	.499				NIM	.492	.065	.399			
Avoidance	1.194	.246	.231				Numbing	1.138	.188	.321			
Step 3				.412	.034	17.9***	Step 3				.418	.010	5.5*
NIM	.485	.065	.393				NIM	.485	.065	.393			
Avoidance	.641	.273	.124				Numbing	.899	.213	.253			
Numbing	.899	.213	.253				Avoidance	.641	.273	.124			
Predicting Anxiety-Related Disorders													
Step 1				.281	.281	121.7***	Step 1				.281	.281	121.7***
NIM	.667	.060	.530				NIM	.667	.060	.530			
Step 2				.377	.096	48.0***	Step 2				.364	.087	43.0***
NIM	.519	.060	.412				NIM	.411	.069	.326			
Avoidance	1.748	.252	.332				Numbing	1.299	.198	.359			
Step 3				.405	.028	14.6***	Step 3				.399	.037	19.2***
NIM	.397	.067	.315				NIM	.397	.067	.315			
Avoidance	1.232	.282	.234				Numbing	.839	.219	.232			
Numbing	.839	.219	.232				Avoidance	1.232	.282	.234			

*** $p < .001$ ** $p < .01$ * $p < .05$

Table 4 (continued)

Step	*B*	*SE*	*β*	R^2	ΔR^2	F_{change}	Reverse	*B*	*SE*	*β*	R^2	ΔR^2	F_{change}
Predicting Anxiety-Related Disorders Traumatic Stress Subscale													
Step 1				.330	.330	153.9***	Step 1				.330	.330	153.9***
NIM	.809	.065	.575				NIM	.809	.065	.575			
Step 2				.480	.149	89.2***	Step 2				.447	.116	65.5***
NIM	.602	.062	.428				NIM	.478	.072	.340			
Avoidance	2.435	.258	.413				Numbing	1.677	.207	.414			
Step 3				.511	.032	20.1***	Step 3				.511	.064	40.1***
NIM	.458	.068	.325				NIM	.458	.068	.325			
Avoidance	1.823	.285	.309				Numbing	.996	.222	.246			
Numbing	.996	.222	.246				Avoidance	1.823	.285	.309			
Predicting Depression													
Step 1				.444	.444	249.2***	Step 1				.444	.444	249.2***
NIM	.807	.051	.666				NIM	.807	.051	.666			
Step 2				.480	.036	21.5***	Step 2				.546	.102	69.8***
NIM	.720	.053	.594				NIM	.541	.056	.447			
Avoidance	1.028	.222	.203				Numbing	1.349	.161	.388			
Step 3				.548	.068	46.4***	Step 3				.548	.002	1.2
NIM	.538	.056	.444				NIM	.538	.056	.444			
Avoidance	.256	.236	.051				Numbing	1.254	.184	.360			
Numbing	1.254	.184	.360				Avoidance	.256	.236	.051			
Predicting Mania													
Step 1				.146	.146	53.4***	Step 1				.146	.146	53.4***
NIM	.445	.061	.382				NIM	.445	.061	.382			
Step 2				.150	.004	1.4	Step 2				.150	.004	1.4
NIM	.418	.065	.359				NIM	.494	.074	.425			
Avoidance	.318	.273	.065				Numbing	-.252	.212	-.075			
Step 3				.161	.011	4.0*	Step 3				.161	.011	4.0*
NIM	.488	.074	.419				NIM	.488	.074	.419			
Avoidance	.614	.309	.126				Numbing	-.481	.241	-.144			
Numbing	-.481	.241	-.144				Avoidance	.614	.309	.126			

*** $p < .001$ ** $p < .01$ * $p < .05$

Table 4 (continued)

Step	*B*	*SE*	*β*	R^2	ΔR^2	F_{change}	Reverse	*B*	*SE*	*β*	R^2	ΔR^2	F_{change}
Predicting Paranoia													
Step 1				.340	.340	160.6***	Step 1				.340	.340	160.6***
NIM	.645	.051	.583				NIM	.650	.051	.586			
Step 2				.351	.015	7.4**	Step 2				.358	.018	8.6**
NIM	.593	.054	.536				NIM	.545	.061	.492			
Avoidance	.614	.225	.133				Numbing	.533	.174	.168			
Step 3				.356	.007	3.5	Step 3				.362	.005	2.3
NIM	.539	.061	.487				NIM	.542	.061	.488			
Avoidance	.386	.256	.083				Numbing	.395	.197	.124			
Numbing	.371	.199	.117				Avoidance	.371	.253	.080			
Predicting Schizophrenia													
Step 1				.485	.485	294.2***	Step 1				.485	.485	294.2***
NIM	.845	.049	.697				NIM	.845	.049	.697			
Step 2				.494	.008	5.0*	Step 2				.510	.025	15.7***
NIM	.803	.052	.662				NIM	.714	.058	.588			
Avoidance	.492	.219	.097				Numbing	.667	.168	.191			
Step 3				.510	.017	10.8**	Step 3				.510	.000	0.2
NIM	.712	.059	.587				NIM	.712	.059	.587			
Avoidance	.106	.246	.021				Numbing	.627	.192	.180			
Numbing	.627	.192	.180				Avoidance	.106	.246	.021			
Predicting Borderline Features													
Step 1				.441	.441	245.9***	Step 1				.441	.441	245.9***
NIM	.793	.051	.664				NIM	.793	.051	.664			
Step 2				.475	.035	20.5***	Step 2				.490	.049	30.0***
NIM	.709	.052	.593				NIM	.610	.059	.511			
Avoidance	.994	.220	.199				Numbing	.925	.169	.269			
Step 3				.498	.023	14.1***	Step 3				.499	.008	5.1*
NIM	.604	.058	.506				NIM	.604	.058	.506			
Avoidance	.552	.245	.110				Numbing	.719	.191	.209			
Numbing	.719	.191	.209				Avoidance	.552	.245	.110			

*** $p < .001$ ** $p < .01$ * $p < .05$

Table 5

Hierarchical Regressions with NIM, Avoidance, and Numbing Predicting Select PAI Treatment Consideration Scales

Step	*B*	*SE*	*β*	R^2	ΔR^2	F_{change}	Reverse	*B*	*SE*	*β*	R^2	ΔR^2	F_{change}
Predicting Suicidal Ideation													
Step 1				.267	.267	113.7***	Step 1				.267	.267	113.7***
NIM	.567	.053	.517				NIM	.567	.053	.517			
Step 2				.276	.009	3.9*	Step 2				.345	.078	36.9***
NIM	.527	.057	.481				NIM	.356	.061	.325			
Avoidance	.467	.237	.102				Numbing	1.068	.176	.339			
Step 3				.347	.071	33.6***	Step 3				.347	.002	0.9
NIM	.359	.061	.327				NIM	.359	.061	.327			
Avoidance	-.247	.257	-.054				Numbing	1.160	.200	.368			
Numbing	1.160	.200	.368				Avoidance	-.247	.257	-.054			
Predicting Stress													
Step 1				.253	.253	105.6***	Step 1				.253	.253	105.6***
NIM	.504	.049	.503				NIM	.504	.049	.503			
Step 2				.269	.016	6.9**	Step 2				.274	.021	9.2**
NIM	.456	.052	.454				NIM	.403	.059	.402			
Avoidance	.573	.218	.136				Numbing	.512	.169	.178			
Step 3				.279	.009	4.1*	Step 3				.279	.004	1.8
NIM	.399	.059	.398				NIM	.399	.059	.398			
Avoidance	.335	.247	.080				Numbing	.387	.192	.134			
Numbing	.387	.192	.134				Avoidance	.335	.247	.080			
Predicting Nonsupport													
Step 1				.273	.273	117.2***	Step 1				.273	.273	117.2***
NIM	.556	.051	.523				NIM	.556	.051	.523			
Step 2				.279	.006	2.5	Step 2				.298	.025	10.9***
NIM	.525	.055	.493				NIM	.441	.061	.415			
Avoidance	.364	.229	.082				Numbing	.582	.176	.190			
Step 3				.298	.019	8.3**	Step 3				.298	0	.001
NIM	.441	.062	.414				NIM	.441	.062	.414			
Avoidance	.008	.258	.002				Numbing	.579	.201	.190			
Numbing	.579	.201	.190				Avoidance	.008	.258	.002			

*** $p < .001$ ** $p < .01$ * $p < .05$

Table 5 (continued)

Step	*B*	*SE*	*β*	R^2	ΔR^2	F_{change}	Reverse	*B*	*SE*	*β*	R^2	ΔR^2	F_{change}
Predicting Treatment Rejection													
Step 1				.339	.339	160.2***	Step 1				.339	.339	160.2***
NIM	-.625	.049	-.583				NIM	-.625	.049	-.583			
Step 2				.365	.026	12.5***	Step 2				.395	.056	28.6***
NIM	-.560	.052	-.522				NIM	-.451	.057	-.420			
Avoidance	-.769	.217	-.171				Numbing	-.883	.165	-.286			
Step 3				.398	.033	16.9***	Step 3				.398	.003	1.5
NIM	-.447	.057	-.417				NIM	-.447	.057	-.417			
Avoidance	-.293	.241	-.065				Numbing	-.773	.188	-.251			
Numbing	-.773	.188	-.251				Avoidance	-.293	.241	-.065			

*** $p < .001$ ** $p < .01$ * $p < .05$

Table 6

Summary of differential relationships of avoidance and numbing with BDI-II, BAI, DES-II, and PAI

	Correlation			ΔR^2	
	Avoidance	Numbing	*Z* score [a]	Avoidance[b]	Numbing[c]
BDI-II	.445**	.660**	5.21***	.005	.088***
BAI	.415**	.554**	3.14**	.013*	.064***
DES-II	.386**	.492**	2.31*	.013*	.021**
PAI Clinical Scales					
Somatic Complaints	.250**	.490**	5.02***	.002	.060***
Anxiety	.408**	.547**	3.12**	.010*	.034***
Anxiety-Related Disorders	.478**	.544**	1.52	.037***	.028***
Anxiety-Related Disorders Traumatic Stress	.565**	.607**	1.05	.064***	.032***
Depression	.414**	.641**	5.36***	.002	.068***
Mania	.193**	.166**	0.52	.011*	.011*
Paranoia	.323**	.441**	2.48*	.005	.007
Schizophrenia	.332**	.525**	4.18***	.000	.017***
Borderline Features	.410**	.559**	3.36***	.008**	.023***
Antisocial Features	.093	.114*	0.40	-	-
Alcohol Problems	.039	.156**	2.24*	-	-
Drug Problems	.088	.112*	0.46	-	-
PAI Treatment Consideration Scales					
Aggression	.128*	.185**	1.10	-	-
Suicidal Ideation	.273**	.523**	5.32***	.002	.071***
Stress	.298**	.406**	2.23*	.004	.009*
Nonsupport	.257**	.426**	3.48***	.000	.019**
Treatment Rejection	-.357**	-.525**	3.67***	.003	.033***

*** $p < .001$ ** $p < .01$ * $p < .05$

NOTE: Adapted from table presented by Ben-Porath, McCully, & Almagor (1993).

[a] Z score testing the difference between correlated correlation coefficients as suggested by Meng, Rosenthal, & Rubin (1992)

[b] Incremental contribution of avoidance after accounting for the contributions of NIM and Numbing

[c] Incremental contribution of numbing after accounting for the contributions of NIM and Avoidance