Construct Validity of Three Measures of Depersonalization in Trauma-Exposed College Students

by

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Abstract

Depersonalization is a type of dissociation characterized by feelings of unreality and detachment from one's sense of self. Despite a history rich in clinical description, depersonalization has proven difficult to define and thus measure. Not surprisingly, available measures of depersonalization have limited psychometric support. The present study examined the construct validity of three self-report measures of depersonalization using a sample of trauma-exposed college students. Depersonalization measures included the Dissociative Experiences Scale (DES; Bernstein & Putnam, 1986), the Cambridge Depersonalization Scale (CDS; Sierra & Berrios, 2000), and the Multiscale Dissociation Inventory (MDI; Briere, 2002). These three measures were compared with respect to their pattern of correlations with a range of theoretically relevant self-report measures of psychopathology. Using Westen and Rosenthal's (2003) procedure for evaluating a pattern of convergent-discriminant relationships, all three measures demonstrated good construct validity. The CDS and MDI demonstrated the best convergent, discriminant, and content validity, and the results strongly supported the use of the CDS and MDI for the assessment of depersonalization in this population. Implications for further understanding and refining the construct of depersonalization are discussed.

Table of Contents

List of Tables

Introduction

Depersonalization is a psychological experience characterized by a sense of detachment from one's self and environment that often leads to significant distress and impairment (Guralnik, Schmeidler, & Simeon, 2000). Descriptions of depersonalization have remained fairly stable since they first emerged more than one hundred years ago (Sierra & Berrios, 2001). Clinical observations have linked a number of cognitive, affective, and perceptual experiences with depersonalization, including emotional numbing, impaired concentration, perceptions of the external environment as two-dimensional, and an inability to recognize one's own voice or reflected image (Hunter, Phillips, Chalder, Sierra, & David, 2003). Other common symptoms include altered perceptions of the physical self (e.g., feeling as if a part of one's body has changed size), loss of sense of agency (e.g., not feeling in charge of one's thoughts or actions), altered perceptions of autobiographical memories (e.g., feeling distant from or not a part of a retrieved memory), and heightened self-awareness (Sierra & Berrios, 2001). Importantly, while experiencing depersonalization, individuals remain aware of the subjective nature of these symptoms, and therefore are not considered delusional (Hunter et al, 2003). In fact, the lack of delusion combined with a heightened self-awareness often exacerbates distress in individuals experiencing depersonalization because they fear they are losing control or going crazy.

Although once considered a rare phenomenon, depersonalization is in fact commonly found in a variety of clinical and non-clinical settings (Simeon, 2004). In a recent review, Hunter, Sierra, and David (2004) found transient depersonalization symptoms frequently reported in student and non-clinical populations, with lifetime prevalence rates ranging from 26-

1

74%. Hunter and colleagues (2004) also found that current clinically significant depersonalization symptoms was reported in 1-2% of participants randomly selected from community surveys, which is comparable to the prevalence of obsessive compulsive disorder, and that the prevalence of current clinically significant depersonalization symptoms in psychiatric inpatients ranged from 42- 91%. Further, depersonalization is commonly seen in a variety of psychological conditions, including panic attacks (Hunter et al., 2003; Cox & Swinson, 2002), borderline personality disorder (Zanarini, Ruser, Frankenburg, & Hennen, 2000; Simeon, Gross, Guralnik, Stein, Schmeidler, & Hollander, 1997), and acute reactions to traumatic stress (Simeon, Guralnik, Schmeidler, Sirof, & Knutelska, 2001; Harvey & Bryant, 1998; Bremner, Steinberg, Southwick, Johnson, & Charney, 1993). Finally, although depersonalization is often studied as a feature of other forms of psychopathology, depersonalization disorder is recognized as one of the five dissociative disorders in *DSM-IV-TR*, and is defined as a "persistent or recurrent feeling of being detached from one's mental processes or body that is accompanied by intact reality testing" (APA, 2000, p. 519).

Researchers have proposed a number of theories of depersonalization. One of the first theories grew out of Pierre Janet's theory of dissociation in the latter part of the 19th century (see van der Hart & Friedman, 1989, and van der Kolk & van der Hart, 1989, for a full discussion). Janet's model of the mind distinguishes among levels of consciousness. Some psychological activity exists at a subconscious level that is outside one's control and isolated from conscious awareness. The origin of subconscious activity is attributed to a narrowing of one's field of consciousness, or a decrease in the number of psychological phenomenon that can be integrated into conscious awareness at one time. Janet referred to the means by which this reduction of consciousness occurred as dissociation.

According to Janet, dissociation occurs when factors such as physical illness, exhaustion, and intense emotions associated with traumatic experiences disrupt the mind's ability to integrate psychological processes, leaving certain processes split off and isolated from conscious awareness. The isolated or dissociated processes range in complexity from a single thought or image and the feelings associated with it to an entire personality, as in the case of dissociative identity disorder (DID). Janet considered dissociation a coping strategy that functions to mitigate aversive emotional reactions to stressful life events. However, he also noted that dissociation may outlive its initial utility and become maladaptive. In that case, the individual is chronically unable to integrate different aspects of their experience and becomes emotionally constricted.

With respect to depersonalization specifically, Sierra and Berrios (1997) described Janet's theory as an important shift from earlier models that described depersonalization as a sensory deficit to a model of depersonalization as an active process. According to Sierra and Berrios, Janet believed that the disintegration that occurs in depersonalization is between two types of experiences: primary and secondary. Primary experiences include all actions elicited by external stimuli, such as a reflexive motor response or a triggered memory, while secondary experiences refer to the "background echo" or internal representations of primary experiences. When the two types, primary and secondary, are disconnected, an individual experiences their perceptions, motor activity, emotions, and self as incomplete. Lost is the sense of a continuous self that occurs when primary and secondary experiences are integrated.

Since Janet's theory of depersonalization several other theories have been proposed. For example, Mayer-Gross (1935) and Roth (1959) described depersonalization as a pre-formed functional response in the brain shaped by evolution. From this perspective, depersonalization is seen as an adaptive mechanism involving increased arousal with dissociated emotion, serving to

increase one's chances of survival in life-threatening situations. Hunter et al. (2003) offered a cognitive-behavioral conceptualization of the onset of depersonalization and its development into a chronic disorder. According to the cognitive-behavioral model, depersonalization disorder results from the misinterpretation of transient depersonalization symptoms as an indication of permanent brain damage or severe mental illness, which in turn leads to increased anxiety and consequently increased depersonalization symptoms. Cognitive and behavioral attempts to avoid further depersonalization paradoxically increase symptom monitoring and prevent disconfirmation of misinterpretations. Expanding on Mayer-Gross's conceptualization, Sierra and Berrios (1998) developed a neurobiological model of depersonalization. According to their model, depersonalization is a hard-wired biological response involving simultaneous emotional inhibition and vigilant alertness. Depersonalization evolved to help individuals cope with life-threatening situations in which an individual has no control over their surroundings and the source of danger is unknown. The restriction of nonfunctional emotional responses (e.g., fight or flight) and the increase of vigilant attention allow individuals to scan the environment for important information. When experienced in a non-threatening situation, such a pattern of response engenders a disturbing experience combining an enhanced sensory clarity with a sudden lack of emotional feeling.

Recent studies have provided empirical support for the neurobiological model. For example, Sierra et al. (2002) found a reduction in autonomic response to aversive stimuli in individuals with depersonalization disorder, but not in individuals with anxiety disorders or healthy controls. However, like the anxiety disorder group, the depersonalization disorder group had heightened anxiety ratings and quicker responses to neutral stimuli relative to controls. This pattern of findings is consistent with the reduced emotional response and increased vigilance

4

postulated by the neurobiological model. In addition, Phillips et al. (2001) found reduced neural activation in regions associated with the perception of negative emotion in individuals with depersonalization disorder, as predicted by the emotional inhibition component of the neurobiological model.

Dissociation and depersonalization are now well-established psychological constructs, with increasingly well-articulated theoretical models and extensive empirical literatures. Nonetheless, the transition from clinical description to operational definition and scientific investigation has proven difficult and generated much debate. After more than a century of research, there is still no commonly accepted definition of dissociation (Dell, 2006). Currently, various definitions include (a) behaviors and perceptions that occur outside of consciousness, (b) the presence of two or more mental processes that are disintegrated or not associated, and (c) the co-occurrence of distinct mental systems normally integrated in conscious awareness, memory, or identity (Cardeña, 2004). *DSM-IV-TR* defines dissociation as a "disruption in the usually integrated functions of consciousness, memory, identity, or perception" (APA, 2000, p. 519). Researchers have argued over the difference between dissociation and repression (Spiegel & Cardeña, 1991) and between "dissociative" as a descriptive label referring to an interruption in conscious awareness and "dissociation" as a process or defensive mechanism (Kihlstrom, 2005). The term dissociation has been used to refer to a wide variety of phenomena and processes including identity confusion, multiple identities, divided attention, absorption, trance, reduced awareness, flashbacks, and depersonalization (Brown, 2006; Holmes et al., 2005).

Most recent efforts at integrating disparate definitions of dissociation agree that it is not a unitary phenomenon. As Holmes et al. (2005) point out, a number of researchers have converged on a similar two-part categorization of dissociation, which the authors label "detachment" and

"compartmentalization." Detachment is defined as "an altered state of consciousness characterized by a sense of separation from the self (as in depersonalization) or the world (as in derealization)" and defined compartmentalization as "an inability to deliberately control actions or cognitive processes that would normally be amenable to such control" (p. 18). Holmes et al. note that although detachment and compartmentalization are distinct, they may co-occur. For example, individuals with posttraumatic stress disorder (PTSD) may experience both depersonalization (e.g., detachment) and amnesia (e.g., compartmentalization) following exposure to a traumatic event. According to Holmes et al., the detachment / compartmentalization classification has received considerable empirical support, with studies demonstrating the existence of detachment in isolation of compartmentalization, the consistent division of depersonalization and amnesia in factor analytic studies of the DES, and the existence of a distinct neurophysiological profile of detachment in experimental studies.

Growing consensus that dissociation is a multifaceted construct has led to increased studies of specific types of dissociation, including the study of depersonalization. Increased interest in depersonalization has led to some clarification concerning its etiology, course, and comorbidity with other conditions. However, it has also highlighted the numerous challenges involved in establishing an operational definition suitable for scientific study. Like dissociation, depersonalization is a subjective experience with no characteristic behavioral manifestations (Levy & Wachtel, 1978; Radovic & Radovic, 2002). As such, the major basis for its diagnosis is the subjective, self-report of the individual experiencing it (Radovic & Radovic, 2002). Another difficulty in defining depersonalization is the ambiguous language used to describe it, such as "feelings of unreality" and "as if." Radovic and Radovic (2002) review some of the semantic difficulties that have developed from using such language. First, the term "unreal" has various

meanings and may refer to non-existence, made up, or not normal. For example, an imaginary friend might be described as "unreal," meaning it does not exist or is made up. The experience of one's body or self might also be described as "unreal," meaning changed in some way from what is normally experienced. The meaning of the term "unreal" varies by context. Second, the use of the phrase "as if" may also have various meanings. The use of "as if" to describe depersonalization is often suggested as evidence of lack of delusion (e.g., it feels *as if* one is a robot, implying that one does not in fact believe oneself to be a robot). While this may be true, the strange and unfamiliar quality of depersonalization makes it difficult to accurately describe within the limits of language, and thus contribute to an individual using "as if" as a way of expressing doubt over the adequacy of a proposed explanation.

Use of the term "derealization" has also hindered development of a clear operational definition of depersonalization. This term, which originated in the early 20th century after the term depersonalization had already been established (Sierra & Berros, 2001), is defined in *DSM-IV-TR* as "an alteration in the perception or experience of the external world so that it seems strange or unreal" (APA, 2000, p. 822). Although *DSM-IV-TR* distinguishes between derealization and depersonalization, defined as an "alternation in the perception or experience of the self so that one feels detached from, and as if one is an outside observer of, one's mental processes or body (e.g., feeling like one is in a dream)" (APA, 2000, p. 822), there is no conclusive support that the two phenomena are independent (Sierra & Berrios, 2001). Currently, most investigators consider derealization and depersonalization to be different perspectives on the same phenomenon and do not differentiate them (Sierra, Baker, Medford, & David, 2005). Dugas, who coined the term depersonalization in the late 1800's, recognized the essential equivalence of these two terms: "[in depersonalization] the individual feels a stranger amongst

things, or if one prefers, things appear strange to him" (translated by Sierra & Berrios, 1996). In other words, either the environment feels strange to the person, or the person feels strange in the environment. Consistent with this approach, unless otherwise specified, in the present study depersonalization is considered to encompass experiences both of unreality of the self ("depersonalization") and of the environment ("derealization").

Difficulties defining depersonalization have contributed to difficulties developing instruments to accurately measure it. Although several measures have been developed, they vary in content, primarily as a result of each measure using different definitions of depersonalization, and in comprehensiveness of the symptoms represented. Further, some of the measures have received relatively limited psychometric support.

The most widely used measure of depersonalization is the Dissociative Experiences Scale (DES; Bernstein & Putnam, 1986), a 28-item self-report measure of the frequency of dissociative experiences. In the original DES, participants rate how often they experience each symptom by marking the percentage on a 100-mm line with anchors at 0% and 100%. In the revised version (DES − II), participants rate the percentage of the time they experience each symptom on an 11-point Likert-scale ranging from 0% to 100% in increments of ten. The revised DES (used in the current study) was designed to ease scoring and is considered comparable to the original version (Carlson & Putnam, 1993). A total dissociation score is calculated by averaging responses to all 28 items. Several studies have examined the factor structure of the DES and found support for its division into three subscales (Stockdale, Gridley, Balogh, & Holtgraves, 2002; Carlson et al., 1991; Schwartz & Frischholz, 1991). Subscale scores are calculated by averaging the responses to the items corresponding to three factors: amnesia (e.g., "Some people find that they have no memory for some important events in their lives (for example, a wedding or graduation"),

absorption (e.g., "Some people sometimes find that they become so involved in a fantasy or daydream that it feels as though it were really happening to them"), and depersonalization (e.g., "Some people sometimes have the experience of feeling that their body does not belong to them").

During development of the DES, items were generated based on discussions with clinical experts and interviews with individuals meeting criteria for a dissociative disorder (Bernstein & Putnam, 1986). The authors included items related to disturbances in identity, memory, and awareness, feelings of depersonalization, and absorption. Subjects included 31 college students, 34 healthy adults, 14 individuals with alcoholism, 24 individuals with PTSD, 20 individuals with schizophrenia, and 20 individuals with dissociative identity disorder.

Bernstein and Putnam (1986) found the DES to have good split-half reliability (ranging from .71 to .96) and good test-retest reliability (.84). Item-total correlations ranged from .50 to .79 with a median of .64. The DES demonstrated good criterion-related validity in that item scores were able to distinguish subjects with and without a dissociative disorder diagnosis. In a review of the DES since its introduction, Carlson and Putnam (1993) extended the reliability and validity evidence found in their initial study. Many factor analytic studies of the DES have supported the division of the DES into three subscales. However, results have not been consistent, particularly in non-clinical samples (Stockdale, Gridley, Balogh, & Holtgraves, 2002). In an attempt to clarify the factor structure of the DES in non-clinical samples, Stockdale, Gridley, Balogh, and Holtgraves (2002) conducted confirmatory factor analyses on one-, two-, three-, and four-factor models of DES scores for two samples of university students, and found support for the three-factor structure. However, Stockdale et al. caution that the three factors accounted for only 45.8% of the variance, leaving a significant percentage unexplained.

There are several limitations in using the DES to measure depersonalization. First, the DES was not intended to be used in non-clinical populations, although it often is (Carlson & Putnam, 1993). Second, the DES tends to measure the number of dissociative experiences rather than the severity of symptoms, which may not be equivalent (Holmes et al., 2005). Third, the depersonalization subscale is comprised of only six items, including one item describing auditory hallucinations, which seems to lack face validity (Sierra & Berrios, 2000). Waller, Putnam, and Carlson (1996) note that the DES depersonalization items represent more extreme forms of depersonalization such as out-of-body experiences and sensory disturbances. However, other symptoms, such as emotional numbing, heightened self-observation, and alterations in the experience of autobiographical memory, lack representation. Based on an examination of item content, the DES appears to under-represent a number of symptoms theoretically and empirically associated with depersonalization.

The Cambridge Depersonalization Scale (CDS; Sierra & Berrios, 2000) is a more recent self-report instrument assessing depersonalization specifically. It contains 29 items measuring depersonalization symptoms, each rated on two separate scales for frequency (0 = never to 4 = all the time) and duration (1 = few seconds to 6 = more than a week). A total depersonalization score is calculated by summing all item scores. Participants report only those symptoms occurring within the past six months.

The item pool for the CDS developed from a comprehensive literature review of the descriptive psychopathology of depersonalization and included a statistical analysis of 200 published cases. Based on the neurobiological model of depersonalization, symptoms associated with inhibited emotional processing (e.g., loss of affection for others) and heightened arousal (e.g., alterations in the perception of objects or body parts) were included in the item pool. After

an initial version of the scale was piloted in a sample of 40 healthy adults and 10 patients with anxiety disorders, revisions were made after consulting with experts in scale construction. The final version of the CDS was standardized using 35 individuals with depersonalization disorder, 22 individuals with either panic disorder or generalized anxiety disorder, and 20 individuals with temporal lobe epilepsy.

Initial reliability and validity evidence for the CDS supports its psychometric merit. Sierra and Berrios (2000) found the internal consistency and split-half reliability of the CDS to be .89 and .92, respectively. The CDS demonstrated good criterion-related validity in that CDS scores were able to differentiate individuals with depersonalization disorder from individuals with anxiety and temporal lobe epilepsy. Sierra et al. (2005) conducted an exploratory factor analysis of the CDS that derived four factors: anomalous body experience, emotional numbing, anomalous subjective recall, and alienation from surroundings. The four-factor model accounted for 73.3 % of the variance and had relatively low correlations between factors, ranging from .23 to .34 (Sierra et al., 2005). Simeon et al. (2008) conducted a confirmatory factor analysis of the CDS and failed to replicate the factor structure found by Sierra et al. (2005). Simeon et al. then conducted an exploratory factor analysis which extracted five factors accounting for 55.8% of the variance. The five-factor model was similar to the four-factor model, with the exception that "anomalous body experience" separated into two factors, "unreality of self" and "perceptual alterations."

One limitation of the CDS is the relatively small number of psychometric studies examining its reliability and validity. Another limitation is the utility of the CDS in non-clinical populations (Sierra & Berrios, 2000). Because the CDS has only been tested with clinical

samples, further research is needed to examine whether the CDS is a useful measure of depersonalization in community and student samples.

The Multiscale Dissociation Inventory (MDI; Briere, 2002) is another recently developed self-report instrument measuring dissociation. The MDI consists of 30 items divided into six scales measuring different types of dissociative experiences. Participants rate the frequency of each item on a 5-point scale ranging from 1 (never) to 5 (very often) and report only symptoms occurring in the past month.

The six MDI scales include disengagement, depersonalization, derealization, emotional constriction, memory disturbance, and identity dissociation (Briere, 2002). Disengagement refers to affective and/or cognitive separation from one's present surroundings and is similar in item content to the DES absorption scale. Emotional Constriction refers to reduced emotional responsiveness. Memory Disturbance refers to the inability to remember personal events and is similar to the DES amnesia scale. Identity Dissociation refers to the experience of more than one personality within oneself. The Depersonalization and Derealization scales are similar to *DSM-IV-TR* definition of an alteration in one's perception of the self (depersonalization) or environment (derealization). Given the lack of support for this distinction (as previously discussed), the MDI Depersonalization and Derealization items were combined into one scale in the present study. In addition to the theoretical rationale for combining the scales, empirical evidence also supports this choice. Briere, Weathers, and Runtz (2005) conducted a factor analysis of the MDI using a combined sample of 1,326 general population, university, and clinical participants. The analysis yielded five factors accounting for 68% of the variance. The factors matched onto the scales of the MDI, with the exception that the depersonalization and derealization items combined into one factor.

The initial item pool for the MDI contained 90 statements assessing each of the six types of dissociation listed above. Thirty items were removed after consultation with experts in assessment and with experts in the treatment of dissociation. An item analysis was conducted after an initial administration in a general population sample, resulting in the removal of 30 more items. The final version of the MDI was standardized using a university sample (573 students from a mid-sized Canadian university), a clinical sample (93 clients from the caseload of 12 clinicians across the United States), and a community sample (70 trauma-exposed community residents).

Briere (2002) found good reliability and validity evidence for the MDI. Internal consistency coefficients ranged from .77 to .92 across the three samples. The MDI demonstrated good criterion-related validity, in that MDI scores predicted PTSD diagnosis. The MDI correlated strongly with other measures of dissociation, including the DES, and less strongly with measures of non-dissociative constructs, including anxiety and anger; however, the MDI did correlate strongly with measures of depression, with correlations ranging from .60 to .66.

One limitation of the MDI is the small number of studies examining its psychometric properties. Although initial findings are encouraging, further evidence is needed to demonstrate the reliability and validity of the MDI scales. Another limitation of the MDI as a measure of depersonalization is the separation of emotional constriction items from depersonalization and derealization items. Experiences of emotional numbing, such as loss of affection for others and reduced fear in life-threatening situations, have been associated with depersonalization (Sierra & Berrios, 2000); thus, the assessment of depersonalization without items representing emotional constriction may not adequately capture the full construct.

Despite the limitations of available self-report measures, in an effort to establish the

convergent and discriminant validity of depersonalization, recent studies have found a number of

preferential associations with constructs that have historically been associated with

depersonalization. For example, several investigators have found a significant correlation

between depersonalization and anxiety (Hunter et al., 2003; Noyes & Kletti, 1977; Roth, 1959).

The historical link between depersonalization and anxiety is reflected in Roth's (1959)

description of the "phobic anxiety – depersonalization syndrome." According to Roth,

depersonalization and anxiety were so closely associated that they constituted a single neurotic

illness. More recent research has highlighted the role of depersonalization in anxiety-related

disorders. Cox and Swinson (2002) found that 71% of their sample of patients with panic

disorder experienced episodes of depersonalization. Two-thirds of the depersonalization-positive

group reported depersonalization both as a part of and separate from panic attacks.

Depersonalization has been found to significantly correlate with social anxiety, even after

controlling for global severity of distress (Michal et al., 2005). Depersonalization has also been

related to obsessive – compulsive symptomatology, based on similarities in phenomenology,

neurochemistry, and response to treatment (Simeon, Stein, & Hollander, 1995). However, not all

studies have found evidence for a significant association between depersonalization and

obsessive – compulsive symptoms (see Sierra & Berrios, 2000).

As previously mentioned, depersonalization is frequently associated with trauma

exposure (Spiegel & Cardeña, 1991). Depersonalization has been found in combat veterans with

PTSD (Bremner, Steinberg, Southwick, Johnson, & Charney; 1993) as well as in individuals

with acute stress disorder (ASD; Harvey & Bryant, 1998). One recent study on the relationship

between trauma and depersonalization found childhood interpersonal trauma highly predictive of

depersonalization scores in individuals with depersonalization disorder (Simeon, Guralnik, Schmeidler, Sirof, & Knutelska, 2001). The authors found that among the various types of trauma examined, emotional abuse was the strongest predictor of depersonalization disorder diagnosis and depersonalization severity.

Despite the high comorbidity between depersonalization and depression, research examining this relationship is scarce. In their review of the literature on depersonalization and mood disorder, Mula, Pini, and Cassano (2007) conclude that depersonalization is associated with increased severity of depression and poorer response to treatment. They suggest that severe alterations in mood may sufficiently upset the stability of the self to precipitate experiences of depersonalization. A number of self-report studies have found significant correlations between measures of depersonalization and depression. For example, Lambert, Senior, Fewtrell, Phillips, and David (2001) found the DES depersonalization scale to correlate 0.58 ($p < .01$) with the Beck Depression Inventory. Similarly, Briere, Weathers, and Runtz (2005) found the MDI Depersonalization and Derealization items to correlate 0.52 *($p < .01$)* with the PAI Depression scale.

Depersonalization has been identified as one of three areas of cognitive disturbance associated with borderline personality disorder (BPD; Gunderson & Singer, 1975). Zanarini, Ruser, Frankenburg, and Hennen (2000) examined dissociative experiences in a sample of 290 inpatients with BPD and 90 inpatient controls with an Axis II diagnosis other than BPD. The patients with BPD reported significantly higher scores than controls on self-report items measuring depersonalization. Similarly, Korzekwa, Dell, Links, Thabane, and Fougene (2009) found that most of their sample of outpatients with BPD endorsed some degree of depersonalization. The authors note, however, that dissociation in BPD is frequently related to

trauma exposure, which makes the specificity of the link between depersonalization and BPD less clear.

A number of other psychological constructs have also been associated with depersonalization. For example, depersonalization has been associated with somatization and conversion (Spitzer, Spelsberg, Grabe, Mundt, and Freyberger, 1999). Indeed, the link between conversion and dissociation dates back to late 19th century psychodynamic conceptualizations of hysteria (Kihlstrom, 1994). Depersonalization has also been associated with schizotypy. Watson (2001) found depersonalization and schizotypy to be almost indistinguishable in a factor analytic study using a college student sample. In contrast, Simeon, Guralnik, Knutelska, and Nelson (2004), using the same measures as Watson (2001), found only perceptual distortions to be elevated in individuals with depersonalization disorder, compared to healthy controls, after controlling for Axis II comorbidity. Simeon et al. (2004) suggest that a more restricted range of psychopathology in Watson's student sample, compared to their clinical sample, might have prevented a clear-cut distinction between dissociation and schizotypy.

Initial studies examining the convergent and discriminant validity of depersonalization measures have provided encouraging results. However, these studies have examined a limited number of constructs believed to be associated with depersonalization, with a limited number of measures of depersonalization. In addition, most of the empirical support for the assessment of depersonalization comes from data collected in clinical samples, limiting the generalizability of the findings. The current study adds to the existing literature by comparing three measures of depersonalization (DES, CDS, and MDI) with instruments measuring a variety of theoretically relevant correlates in a trauma-exposed college student sample. In the context of current theory

and empirical literature, the following hypotheses were posited regarding the DES, CDS, and MDI, and their association with specific correlates:

Hypothesis 1: Internal consistency. All three depersonalization measures were predicted to demonstrate high internal consistency. Based on previous reliability analyses, it was hypothesized that alphas range between .85 and .95 (e.g., Briere, 2002; Sierra & Berrios, 2000; and Bernstein & Putnam, 1986).

Hypothesis 2: Convergent validity. Given the DES depersonalization scale, CDS, and MDI depersonalization scale all claim to measure the same underlying construct, it was expected that the three measures demonstrate good convergent validity. Based on previous psychometric studies as well as theoretical considerations, it was expected that the DES depersonalization scale, CDS, and MDI depersonalization scale show strong, positive associations with one another (e.g., $r \geq .80$).

Hypothesis 3: Discriminant validity. The shared method variance of the measures of self-reported psychopathology used in this study was considered in predicting the discriminant pattern of correlations. Specifically, all measures were expected to show a minimum small positive correlation. Examination of the intercorrelations among the PAI scales gave further support for this decision (see Morey, 1991, 2007). The depersonalization measures were predicted to correlate most highly ($r = .60$) with the other dissociation scales in the "detachment" category (e.g., emotional constriction) described previously by Holmes et al. (2005). The depersonalization measures were predicted to correlate almost as highly ($r = .50$) with the dissociation scales in the "compartmentalization" category (e.g., amnesia). Correlations with depression, borderline personality disorder, and facets of schizophrenia, constructs theoretically and empirically linked with depersonalization, were also predicted to be .50. The

depersonalization measures were expected to correlate moderately ($r = .40$) with constructs within but not central to its nomological network, such as anxiety, conversion, and traumatic stress. The depersonalization measures were predicted to correlate weakly ($r = .20$) with obsessive-compulsive and paranoia symptoms, constructs less related to depersonalization, but potentially associated through their correlation with anxiety (Morey, 1991, 2007). Lastly, the smallest correlations ($r = .10$) were predicted between the depersonalization measures with mania and antisocial personality features, constructs least theoretically related to depersonalization.

Method

Participants

Participants were recruited by an announcement through the SONA extra credit system for students of any age in eligible undergraduate psychology courses. They self-identified as eligible by reading the announcement and affirming they had "directly experienced a very stressful event (for example, a natural disaster, motor vehicle accident, or physical or sexual assault) and continue to be affected by it." Questionnaire sessions were conducted several times a week, with a maximum of 20 participants per session. Participants were compensated with documentation of their participation that could be used as extra credit in many undergraduate psychology courses. The Auburn University Institutional Review Board approved the study.

Participants were 277 undergraduate students who completed the questionnaire session. Of those, 77 were excluded based on the following criteria: participant's index event did not meet criterion A1 for a traumatic event based on the Life Events Checklist ($n = 28$); 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 ($n = 38$; Morey, 2003); participant left more than 10% of a measure blank ($n = 11$). The final sample consisted of 200 participants. For cases in which less than 10% of a measure was left blank, the lowest value of the measure was substituted for the missing response, following the guidelines outlined in the PAI and MDI manuals (Morey, 1991, 2007; Briere, 2002). No guidelines for handling missing responses were available for the

other measures used in the study; therefore, the same guidelines suggested for the PAI and MDI were applied to the CDS, DES, and PCL.

Participants were predominantly female (*n* = 120; 61%) and Caucasian (*n* = 162; 82%) or African American (*n* = 24; 12%). Participants' ages ranged from 18 to 26 years (*M* = 19.8; *SD* = 2.1). All participants endorsed at least one event that met the definition of a trauma in Criterion A1 of *DSM-IV-TR*.

Measures

Participants first completed a demographics form, followed by a measure of trauma exposure and a measure of PTSD symptoms. The other measures were counterbalanced such that the longest measure (Personality Assessment Inventory; Morey, 1991, 2007) was always presented last, depersonalization measures (three) were randomized within a block, and health measures (three, not relevant to this study) were randomized within a block. The presentation of the two blocks was also randomized. A description of the three measures used to assess depersonalization (DES, CDS, and MDI) was discussed in the previous section. A description of the measures assessing trauma exposure, other psychopathology, and personality traits is discussed below.

Life Events Checklist (LEC; Blake et al., 1995). Trauma exposure was assessed using the LEC. The LEC is the self-report trauma assessment portion of the Clinician-Administered PTSD Scale (Blake et al., 1990), the most widely used structured interview for PTSD. The LEC consists of 17 items, including 16 items that assess exposure to specific categories of traumatic events (natural disaster, sexual assault, etc.) and one item, labeled "other," that assesses exposure to events that do not fit into one of the specific categories. Respondents indicated their lifetime exposure to each of the categories of events by checking one or more of the following options:

20

happened to me, witnessed it, learned about it, not sure, and does not apply. Next, they identified the worst event (the one that has caused the most problems), and reported 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 (intense fear, helplessness, or horror). Finally, participants provided a brief narrative of their worst event.

Posttraumatic Stress Disorder Checklist (PCL; Weathers, Litz, Herman, Huska, & Keane, 1993). The PCL is a self-report measure used to assess each of the 17 DSM-IV-TR symptoms of PTSD. There are three versions of the PCL. The civilian and military versions (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 17 items. 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 symptom 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. The PCL was used as a continuous measure in the present study.

Personality Assessment Inventory (PAI; Morey, 1991, 2007). The PAI is a 344-item self-report measure used to assess symptoms of a broad range of psychopathology and personality traits. The PAI includes four validity scales to assess particular patterns of responding, such as the tendency to present oneself in an overly positive or negative way; 11 clinical scales; 2 interpersonal scales, and 5 treatment scales. The PAI was standardized using community and clinical samples. The test-retest reliability of PAI subscales was greater than .8, and median

internal consistency rates are reported to range between .81 and .86. Community norms will be used in the scoring of the current study.

The following PAI scales will be used in the current study:

Inconsistency (ICN). The ICN scale is a validity scale consisting of 10 pairs of items with similar content. Five of the pairs should be answered in an opposite manner and five of the pairs should be answered similarly. Elevations on this scale reflect careless responding or confusion and should be considered invalid (Morey, 2003).

Infrequency (INF). The INF scale is a validity scale useful in detecting random responding. Individuals who complete the PAI in an idiosyncratic way due to carelessness, reading difficulties, or confusion will likely receive elevated scores on the INF scale. High scores on the INF scale suggest that the respondent did not properly attend to item content and interpretation of test results should be considered invalid (Morey, 2003).

Negative Impression Management (NIM). The NIM scale is a 9-item validity scale that measures negative distortion in self-presentation. To address concerns that response bias could confound the findings by elevating scores on all measures, the NIM scale will be used to control for response bias effects. It includes items reflecting an exaggerated or distorted impression of the self and current circumstances and items that are unlikely and bizarre (Morey, 2003, pp. 49).

Conversion (SOM – C). The SOM-C scale is an 8-item clinical scale measuring sensory and motor symptoms prevalent in conversion disorders. Elevations may reflect impairments in perception (e.g., vision problems, hearing problems, or numbness) or motor problems (e.g., paralysis) (Morey, 2003).

Anxiety (ANX). The ANX scale is a 24-item clinical scale measuring cognitive, affective, and physiological anxiety. Elevations on this scale may indicate an individual who is often tense, worrying, and may be nervous, timid, or dependent (Morey, 2003).

Obsessive-Compulsive (ARD – O). The ARD – O scale is an 8-item clinical scale measuring both the symptomatic features of the Axis I disorder and the personality features of the Axis II disorder. Elevations on this scale may indicate the presence of intrusive thoughts or behaviors, rigidity, indecision, perfectionism, and affective constriction (Morey, 2003).

Traumatic Stress (ARD – T). The ARD – T scale is an 8-item clinical scale assessing the experience of traumatic events that cause lasting distress. Elevations on this scale may indicate symptoms related to responses to traumatic stressors, such as nightmares and sudden anxiety reactions (Morey, 2003).

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, irritability, and grandiosity. Elevations on this scale may reflect a variety of behaviors from being active and self-confident to impulsivity, hostility, restlessness, high energy levels, and poor judgment (Morey, 2003).

Paranoia (PAR). The PAR scale is a 24-item clinical scale assessing 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 disorders of thought. Elevations may reflect unusual beliefs and perceptions, poor social competence, and difficulties with concentration and attention (Morey, 2003).

Identity Problems (BOR - I). The BOR – I scale is a 6-item clinical scale measuring difficulties in identity development, one feature associated with borderline personality disorder. Elevations may reflect feelings of emptiness, lack of fulfillment, an absence of purpose, and anxiety surrounding identity issues (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).

Procedure

Questionnaire sessions were conducted in a computer lab so that participants could complete the questionnaires online, under the supervision of a graduate student. When participants arrived at the designated computer lab, computers were logged on and the information letter appeared on the computer screen. A graduate assistant read the entire information letter aloud while participants were encouraged to follow along. Participants indicated their consent to continue with the study by electronically checking a box indicating they had read and understood the information letter and wished to continue. Participants were reminded that they could elect to discontinue the study at any point without risk of retribution or loss of extra credit.

Next, they completed the questionnaires, whose order was randomized by Qualtrics, an online survey software. Participants completed questionnaires assessing trauma-exposure,

depersonalization, and general psychopathology. Participants also completed several measures on health behaviors which were not included in the current study. Participants were provided with a paper copy of the consent form, as well as a debriefing form and referral list, when they left the study. Participants were granted 2.5 hours of extra credit via the Sona Systems website.

Data Analyses

To analyze the data, descriptive statistics and internal consistency (alpha) coefficients for all measures were examined. Next, zero-order correlations were calculated to evaluate the convergent and discriminant validity among the DES, CDS, MDI, and PAI. Finally, statistics developed by Westen and Rosenthal (2003; $r_{\text{alerting-CV}}$ and $r_{\text{contrast-CV}}$) were used to investigate the extent to which the observed pattern of correlations matched the pattern of correlations predicted by theory. Westen and Rosenthal's (2003) procedure is summarized below.

As noted by Cronbach and Meehl (1955), one indication of a measure's construct validity is the congruence between its observed pattern of correlations with measures of related constructs and the pattern predicted by theory. Westen and Rosenthal's (2003) procedure allows investigators to quantify the congruence between a set of observed and expected correlations. The procedure is derived from contrast analysis and allows the investigator to test particular hypotheses specified in advance. The predicted correlations are converted to lambdas (λs) by subtracting the mean predicted correlation from each individual predicted correlation, resulting in a set of contrast weights summing to zero. The obtained correlations are converted to Z scores using the Fisher Zr transformation. The first statistic, $r_{\text{alerting-CV}}$, is the simple correlation between the λ and Zr values. The magnitude of $r_{\text{alerting-CV}}$ reflects the degree to which the ordering of predicted versus obtained correlations is consistent.

The second statistic, $r_{\text{contrast-CV}}$, is a more stringent test of the fit between predicted and obtained correlations. The $r_{\text{contrast-CV}}$ index takes into account sample size, the median intercorrelations among the criterion variables, and the magnitudes of the correlations between the target measure (e.g., measure of depersonalization) and criterion measures (e.g., measures of other forms of psychopathology). It involves a series of complex computations, described in detail by Westen and Rosenthal (2003, pp. 617-618). Part of the procedure for calculating $r_{\text{contrast-CV}}$ involves calculating exact p values for Z scores, and then calculating t scores for the exact p values. In the present study, the Z scores fell out of the range necessary to calculate exact p values using a variety of statistical software programs and online statistical calculators. Therefore, a computational adaptation, taken from Poythress et al. (2009), was used to convert Z scores into t values. The adapted formula allows the user to solve for t and then calculate $r_{\text{contrast-CV}}$. The adapted formula has been shown to yield the same results as the original computations (Poythress et al., 2009).

Results

Descriptive Statistics and Internal Consistency

Possible and observed ranges, means, and standard deviations for each of the measures are presented in Table 1. Results of the internal consistency analysis are also presented in Table 1. The CDS and MDI depersonalization scale exhibited high internal consistency in this sample, with alpha coefficients of .93 and .90, respectively. The DES depersonalization scale exhibited adequate internal consistency (alpha = .77). The PAI clinical scales exhibited adequate to high internal consistency, with alphas ranging from .66 (ARD-O and BOR-I) to .91 (ANX).

Correlation Analyses

Correlations among the three depersonalization scales with the other dissociation scales and PAI scales are shown in the left side of Table 2. Convergent validity was assessed by examining the associations among the DES depersonalization scale, CDS, and MDI depersonalization scale. Significantly strong positive correlations among the depersonalization measures were observed, ranging from $r = .65$ ($p < .01$) between the DES Depersonalization scale and CDS, to $r = .82$ ($p < .01$) between the CDS and MDI depersonalization scale.

Discriminant validity was assessed by examining the association of depersonalization measures with measures of other constructs varying in theoretical relatedness to depersonalization. As stated in *Hypothesis 3*, the three depersonalization measures were expected to correlate most highly with measures of other types of dissociation, correlate moderately with related constructs such as trauma exposure, depression, and anxiety, and correlate least with unrelated constructs such as antisocial features. Significantly strong correlations were found

between the other dissociation measures and the DES Depersonalization scale ($r = .44 - .54, p < .01$); the CDS ($r = .54 - .69, p < .01$), and the MDI Depersonalization scale ($r = .51 - .73, p < .01$). Moderate correlations were found between BOR-I, ANX, SOM-C, and ARD-T and the DES depersonalization scale ($r = .32 - .39, p < .01$); the CDS ($r = .39 - .46, p < .01$); and the MDI depersonalization scale ($r = .42 - .49, p < .01$). The weakest correlations were found between ARD-O, MAN, and ANT and the DES Depersonalization scale ($r = .17 - .25, p < .01$); the CDS ($r = .21 - .28, p < .01$); and the MDI Depersonalization scale ($r = .21 - .31, p < .01$).

In general, evidence for discriminant validity was demonstrated for the DES depersonalization scale, CDS, and MDI depersonalization scale. However, a few of the associations between the depersonalization measures and other correlates were higher than expected. Specifically, the correlations between each of the depersonalization measures with the DEP and SCZ scales were as strong as the correlations between the depersonalization measures and other dissociation measures, ranging between $r = .43 - .65$ ($p < .01$) for DEP and $r = .51 - .61$ ($p < .01$) for SCZ. Similarly, the observed correlations between the depersonalization measures and PAR were higher than expected, ranging between $r = .34 - .41$ ($p < .01$).

In order to examine the influence of negative response bias, partial correlations were computed, controlling for NIM, and reported in parentheses in Table 2. The overall pattern of the partial correlations was similar to the bivariate associations; however, the magnitude of the partial correlations, compared to the full correlations, was reduced. After controlling for NIM, the associations remaining significant between the depersonalization measures and PAI scales included: SCZ with the DES depersonalization scale ($r = .24, p < .01$); DEP, BOR-I, and SCZ with the CDS ($r = .25 - .33, p < .01$); and DEP, BOR-I, SCZ, ANX, ARD-T, and MAN with the MDI depersonalization scale ($r = .18 - .34, p < .01$).

Effect Size Indices $r_{\text{alerting-CV}}$ and $r_{\text{contrast-CV}}$

Correlations for the DES depersonalization scale, CDS, and MDI Depersonalization scale with the two other DES scales (Amnesia and Absorption), four other MDI scales (Emotional Constriction, Disengagement, Memory Disturbance, and Identity Dissociation), and ten PAI scales (DEP, BOR-I, SCZ, ANX, SOM-C, ARD-T, ARD-O, PAR, MAN, and ANT) were used to compute two effect size indices, $r_{\text{alerting-CV}}$ and $r_{\text{contrast-CV}}$, to compare observed correlations with a theory-based set of predictions. Predicted correlations and λ values that represent the contrast weights are shown on the right side of Table 2.

The results of these analyses are shown in Table 3. Substantially large values for the first index, $r_{\text{alerting-CV}}$, were found for the DES depersonalization scale, CDS, and MDI depersonalization scale ($r_{\text{alerting-CV}}$ = .88, .88, and .90, respectively). Thus, the order of predicted and observed correlations between the depersonalization measures and criterion variables is highly congruent. The second index, $r_{\text{contrast-CV}}$, was computed for each of the depersonalization measures, and incorporated the median intercorrelation among the criterion variables for each target measure (r = .37 for DES depersonalization scale; r = .35 for CDS; and r = .35 for MDI depersonalization scale). The coefficients for $r_{\text{contrast-CV}}$ were .71, .79, and .83, for the DES depersonalization scale, CDS, and MDI depersonalization scale, respectively, with small corresponding p-values associated with all three values of r. Once again, the magnitude of $r_{\text{contrast-CV}}$ suggests substantial correspondence between the theoretical predictions and observed pattern of correlations. Although statistical procedures for comparing $r_{\text{contrast-CVs}}$ have not been developed, examining the 95% confidence intervals associated with each index has been suggested as one way to compare $r_{\text{contrast-CV}}$ effect sizes (Bombel, Mihura, & Meyer, 2009). Using this method of comparison, the 95% confidence interval around the DES

depersonalization scale's $r_{constrast-CV}$ effect size did not overlap the MDI depersonalization scale

confidence interval. This suggests a weaker match between predicted and observed correlations

for the DES Depersonalization scale than the MDI Depersonalization scale. None of the other

comparisons of $r_{constrast-CV}$ effect size confidence intervals were non-overlapping.

Discussion

In this study, the construct validity of three self-report measures of depersonalization was examined in a trauma-exposed college student sample. Internal consistency coefficients, convergent and discriminant correlation coefficients, and construct validity effect size indices developed by Westen and Rosenthal (2003) were analyzed for the DES, CDS, and MDI. With respect to the first hypothesis, the DES depersonalization scale, CDS, and MDI depersonalization scale exhibited adequate to excellent reliability, as indicated by high alpha coefficients. Given the influence of the number of items in calculating alpha, it should be noted that the three depersonalization measures ranged in number of items from six (DES depersonalization scale) to 29 (CDS). With respect to the second hypothesis, the three depersonalization measures demonstrated good convergent validity. As predicted, the DES depersonalization scale, CDS, and MDI depersonalization scale were strongly correlated, extending existing convergent validity evidence for these measures (Sierra & Berrios, 2000; Briere, 2002).

Regarding the third hypothesis, results generally supported the discriminant validity of the depersonalization measures. The DES, CDS, and MDI correlated more strongly with other measures of dissociation than with measures of moderately related constructs, such as anxiety, borderline personality features, and exposure to traumatic stress; which, in turn, correlated more strongly with depersonalization than measures of least related constructs, such as mania and antisocial features. The high degree of congruence between the predicted and observed pattern of correlations was reflected in large effect size indices $r_{\text{alerting-CV}}$ and $r_{\text{contrast-CV}}$. Based on the set of

correlates chosen and predictions made in this study, the MDI depersonalization scale demonstrated the best match between predicted and observed correlations, followed by the CDS, and then the DES depersonalization scale. In reviewing the item content of the target measures, the CDS and MDI assess for a wider range of symptoms associated with depersonalization than the DES. Given the influence of construct underrepresentation on a scale's validity (Messick, 1995), the narrower range of the DES depersonalization scale may have impacted its subsequent relationship to a number of relevant constructs. All effect size indices, however, were significant, giving evidence to the construct validity of the DES, CDS, and MDI as measures of depersonalization in a non-clinical student sample.

Although $r_{alerting-CV}$ and $r_{contrast-CV}$ allow for the quantification of a pattern of convergent and discriminant relationships, the single number yielded by each statistic does not identify which correlations failed to support the predictions (Smith, 2005). Therefore, a review of individual correlations is necessary to identify any surprising relationships, a few of which were found in the current study. For example, the association between paranoia (PAI PAR) and the depersonalization measures ranged from .34 (DES) to .41 (MDI), which was stronger than expected. Likewise, both mania (PAI MAN) and antisocial features (PAI ANT) were more strongly associated with depersonalization than expected. However, after controlling for negative response bias, none of the correlations with PAI PAR, PAI MAN, or PAI ANT remained significant, with the exception of PAI MAN and MDI ($r = .18$, $p < .01$). As suggested by Mula, Pini, and Cassano (2007), extreme changes in mood may induce experiences of depersonalization, offering one interpretation of this finding.

Interpretation of the present findings is restricted by several limitations. First, the use of self-report measurement introduces risk of participant bias influencing the results and the

addition of error by participants who did not follow instructions. An attempt was made to minimize the effects of careless responding by excluding participants who exhibited response patterns that suggested responding without attention to item content. Partial correlations controlling for response bias were included in Table 2. Although controlling for negative response bias reduced the strength of most of the correlations, the overall rank-order pattern was maintained. Nevertheless, it would be desirable to investigate the convergent and discriminant correlations of depersonalization with relevant correlates using maximally different methods of measurement, such as behavioral observation, clinical interview, and physiological indicators. As emphasized by Campbell and Fiske (1959), a multi-trait, multi-method matrix is needed to separate method from trait variance.

Second, using Westen & Rosenthal's (2003) procedure requires a predetermined selection of external correlates. Although a variety of theoretically and empirically relevant variables were used in the present study, the findings for the DES, CDS, and MDI might have differed with the selection of alternative correlates. Future research will be necessary to determine whether the current findings uphold when different criterion measures are included.

Third, it is important to note these findings were collected using a nonclinical student sample, and therefore these participants were likely to be relatively well-functioning compared to clinical samples. While the observed range of scores shown in Table 2 does not extend the full possible range, a significant amount of variability was found. Likewise, all participants reported exposure to traumatic stress, ranging from motor vehicle accidents to sexual assault. Despite the limitations of using a college student sample, one of the aims of the current study was to extend existing validity evidence for the three depersonalization measures to a non-clinical population. Given the reported prevalence of depersonalization in normal individuals (Mula, Pini, &

Cassano, 2007; Hunter, Sierra, & David, 2004), establishing evidence for the appropriate use of the DES, CDS, and MDI in assessing depersonalization outside of a clinical setting is an important first step in student and community research.

Overall, the findings of this study provide convincing support for the construct validity of the DES, CDS, and MDI as measures of depersonalization in a trauma-exposed college sample. They also suggest that depersonalization is a unique type of dissociation differentially related to a variety of psychopathology and personality features. In light of this finding, measures assessing specific types of dissociation (e.g., CDS) or multiple types of dissociation (e.g., MDI) may be considered more useful than single-score dissociation measures. As noted by Briere, Weathers, and Runtz (2005), the assessment of specific dissociative symptoms allows for more accurate information and specific clinical intervention. Depersonalization is a distressing condition associated with fears of going crazy and losing control, problems maintaining focus on difficult tasks, and interpersonal stress caused by an extreme sense of emotional disconnection (Simeon, 2004). In addition, when comorbid with other disorders, depersonalization is associated with greater clinical severity and poorer response to treatment (Cox & Swinson, 2002; Mula, Pini, & Cassano, 2007). For these reasons, the continued process of construct validation is warranted to further understand depersonalization in both research and practice.

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Appendix

Table 1

Descriptive Statistics for Dissociative Experiences Scale, Cambridge Depersonalization Scale, Multiscale Dissociation Inventory, Personality Assessment Inventory, and Posttraumatic Stress Disorder Checklist

Measure	Items	Possible Range	Observed Range	*M*	*SD*	*Alpha*
DES						
Depersonalization/Derealization	6	0-100	7-70	13.7	7.7	.77
Absorption	16	0-100	9-67	26.4	12.5	.88
Amnesia	6	0-100	7-57	13.6	8.1	.68
CDS	29	0-290	0-226	26.6	28.3	.93
MDI						
Depersonalization/Derealization	10	10-50	10-42	14.1	5.5	.90
Disengagement	5	44-125	44-125	74.1	18.3	.87
Emotional Constriction	5	46-131	46-131	59.9	18.3	.92
Memory Disturbance	5	45-172	45-159	67.1	22.2	.80
Identity Dissociation	5	47-283	47-224	54.9	21.7	.79
PAI Validity Scale						
NIM	9	44-144	44-92	51.1	9.9	.68
PAI Clinical Scales						
SOM-C	8	43-114	43-105	48.9	9.1	.78
ANX	24	34-103	36-96	56.1	11.8	.91
ARD-T	8	41-99	41-99	55.8	13.4	.89
ARD-O	8	25-89	30-86	51.1	11.7	.66
DEP	24	35-111	35-101	54.6	12.4	.90
MAN	24	25-103	29-86	54.3	11.4	.84
PAR	24	29-112	36-86	55.4	11.2	.85
SCZ	24	32-124	33-92	49.8	11.2	.85
BOR-I	6	36-89	36-86	58.1	11.3	.66
ANT	24	36-115	39-90	57.4	11.2	.83
PCL	17	17-85	17-83	35.7	15.6	.94

Note. *N*=200. DES=Dissociative Experiences Scale; CDS=Cambridge Depersonalization Scale; MDI=Multiscale Dissociation Inventory; MDI Depersonalization/Derealization=Multiscale Dissociation Inventory Depersonalization and Derealization Scales combined; PAI=Personality Assessment Inventory; NIM=Negative Impression Management; PIM=Positive Impression Management; SOM-C= Conversion; ANX=Anxiety; ARD-T=Traumatic Stress; ARD-O=Obsessive-Compulsive; DEP=Depression; MAN=Mania; PAR=Paranoia; SCZ=Schizophrenia; BOR-I=Borderline Features - Identity Problems; ANT=Antisocial Features; PCL=PTSD Checklist. T-scores derived from trauma-exposed adult community standardization sample reported for MDI Disengagement, Emotional Constriction, Memory Disturbance, and Identity Dissociation scores. T-scores derived from census-matched standardization sample reported for PAI Validity and Clinical Scales. Raw scores reported for DES scales, CDS, MDI Depersonalization/ Derealization scale, and PCL.

Table 2

Predicted and Observed Correlations between Depersonalization Measures and Criterion Measures, Raw λs, and Integer Values of Raw λs

Criterion Variable	Observed Correlations			Predicted Correlations and λs		
	DES-DP/DR r(pr)	CDS r(pr)	MDI-DP/DR r(pr)	Predicted r	Raw λs	Raw λs as Integers
DES-DP/DR	-	-	-	.80	.34	3
CDS	.65*(.50*)	-	-	.80	.34	3
MDI-DP/DR	.74*(.64*)	.82*(.77*)	-	.80	.34	3
MDI-ECON	.54*(.44*)	.67*(.60*)	.73*(.68*)	.60	.14	1
MDI-DENG	.44*(.27*)	.57*(.27*)	.64*(.52*)	.60	.14	1
DES-ABS	.52*(.38*)	.59*(.38*)	.62*(.51*)	.60	.14	1
MDI-MEMD	.53*(.38*)	.69*(.38*)	.73*(.63*)	.50	.04	0
MDI-IDDIS	.52*(.33*)	.54*(.33*)	.61*(.44*)	.50	.04	0
DES-AMN	.50*(.37*)	.56*(.37*)	.51*(.38*)	.50	.04	0
PAI-DEP	.43*(.14)	.56*(.27*)	.56*(.29*)	.50	.04	0
PAI-BOR-I	.33*(.11)	.46*(.25*)	.46*(.25*)	.50	.04	0
PAI-SCZ	.51*(.24*)	.61*(.33*)	.60*(.34*)	.50	.04	0
PAI-ANX	.36*(.11)	.39*(.09)	.45*(.20*)	.40	-.06	-1
PAI-SOM-C	.32*(-.02)	.42*(.06)	.42*(.08)	.40	-.06	-1
PAI-ARD-T	.39*(.08)	.43*(.09)	.49*(.21*)	.40	-.06	-1
PAI-ARD-O	.17*(.01)	.21*(.04)	.23*(.07)	.20	-.26	-3
PAI-PAR	.34*(.04)	.40*(.05)	.41*(.09)	.20	-.26	-3
PAI-MAN	.25*(.12)	.28*(.13)	.31*(.18*)	.10	-.36	-4
PAI-ANT	.24*(.12)	.21*(.06)	.21*(.07)	.10	-.36	-4

Note. *N*=200. Partial correlations, controlling for PAI Negative Impression Management, reported in parentheses. DES-DP/DR = Dissociative Experiences Scale, Depersonalization/Derealization Scale; CDS = Cambridge Depersonalization Scale; MDI-DP/DR = Multiscale Dissociation Inventory, Depersonalization and Derealization Scales; MDI-ECON = MDI Emotional Constriction Scale; MDI-DENG = MDI Disengagement Scale; DES-ABS = DES Absorption Scale; MDI-MEMD = MDI Memory Disturbance Scale; MDI-IDDIS = MDI Identity Dissociation Scale; DES-AMN = DES Amnesia Scale; PAI = Personality Assessment Inventory; DEP = Depression; BOR-I = Borderline Features – Identity Problems; SCZ = Schizophrenia; ANX = Anxiety; SOM-C = Conversion; ARD-T = Traumatic Stress; ARD-O = Obsessive-Compulsive; PAR = Paranoia; MAN = Mania; ANT = Antisocial Features. *p* < .01.

Table 3

Effect Size Statistics $r_{alerting\text{-}CV}$ and $r_{contrast\text{-}CV}$ for Depersonalization Measures

Quantity	DES-DP/DR	CDS	MDI-DP/DR
$r_{alerting\text{-}CV}$	.88	.88	.90
$r_{contrast\text{-}CV}$	.71	.79	.83
95% CI			
From:	.63	.73	.78
To:	.77	.84	.87
$Z_{contrast}$	11.63	13.73	15.09
$t_{contrast}$	13.96	17.79	20.71
$p_{contrast}$	<.001	<.001	<.001

Note. DES-DP/DR = Dissociative Experiences Scale, Depersonalization/Derealization Scale; CDS = Cambridge Depersonalization Scale; MDI-DP/DR = Multiscale Dissociation Inventory, Depersonalization and Derealization Scales; CI = confidence interval.