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## Heterogeneity of Posttraumatic Stress Symptoms in a Highly Traumatized Low Income, Urban, African American Sample

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### Abstract

Trauma is associated with a range of outcomes; identification of homogeneous profiles of posttrauma symptoms may inform theory, diagnostic refinement, and intervention. The present investigation applies a novel analytic technique to the identification of homogeneous subgroups of post-traumatic symptomatology in a large sample of African American adults reporting high levels of trauma. Latent profiles of posttraumatic stress disorder (PTSD) symptom severity were tested using latent profile analysis. Pseudo-class draws were used to characterize class differences across types of trauma, diagnostic comorbidities, and clinically-relevant features. Participants consisted of 2,915 highly traumatized African Americans living in low income, urban setting and recruited from medical clinics in Atlanta, GA. Findings supported the presence of six distinct subgroups of posttraumatic stress symptom profiles described as *resilient*, *moderate with amnesia*, *moderate with diminished interest*, *moderate without diminished interest and amnesia*, *severe without amnesia*, and *severe overall*. Observed subgroups differed across numerous historical and concurrent factors including childhood trauma, current and lifetime diagnoses of PTSD and major depression, lifetime substance use diagnosis, dissociation, depressive symptoms, emotional dysregulation, negative and positive affect, and history of hospitalization and suicidality. Posttraumatic stress disorder as currently defined is comprised of homogeneous subgroups with important differences in posttraumatic stress symptom endorsement as well as concomitant differentiation of associated diagnoses and clinically-relevant associated features.

### Keywords

Posttraumatic Stress Disorder

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Estimates of the lifetime prevalence of posttraumatic stress disorder (PTSD) range from 5% to 10% (Breslau, Davis, Andreski, & Peterson, 1991; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995a; Norris, 1992), ranking PTSD among the most prevalent psychiatric

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disorders. Nonetheless, the majority of people exposed to traumatic events do not develop PTSD (Breslau, 1998; Breslau et al., 1991; Kessler et al., 2005). There is evidence that PTSD is a heterogeneous, highly comorbid disorder (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995b; Kilpatrick et al., 2003; Miller, Kaloupek, Dillon, & Keane, 2004; Nandi, Beard, & Galea, 2009; Waelde, Silvern, & Fairbank, 2005), suggesting that PTSD may be comprised of latent subgroups of individuals with qualitative differences. PTSD may actually include multiple heterogeneous stress-response syndromes with corresponding treatment- and theory-relevant differences in the neurobiological and environmental influences. Research aimed at distinguishing and characterizing these heterogeneous syndromes is critical for continued advancement of the field of traumatic stress. Recent research has used Latent Profile Analysis (LPA), a person-centered approach to identification of heterogeneous subgroups, to examine the combination of PTSD symptoms and additional dissociation symptoms in samples of participants who met full PTSD criteria according to the Diagnostic and Statistical Manual of the American Psychiatric Association (DSM-IV) (APA, 1994; Steuwe, in press; Wolf, in press). The goal of these studies of PTSD and supplemental dissociation symptoms was to address the question of whether there is a dissociative subtype of PTSD as such a subtype has been proposed for DSM-V. The present investigation is the first application of Latent Profile Analysis (LPA) to an examination focused exclusively on DSM-IV PTSD symptoms. In contrast to the Steuwe et al and Wolf et al studies, our goal was to define homogenous subgroups as defined using the current diagnostic system in traumatized sample representing a range of trauma responses (including resilience, subthreshold PTSD, and DSM-IV PTSD) without the addition of symptoms. Further, we examine how estimated latent subgroups are related to clinically-relevant antecedents and concomitants of PTSD.

Defined by the Diagnostic and Statistical Manual of the American Psychiatric Association (DSM-IV; (APA, 1994)), core symptoms of PTSD include re-experiencing/intrusion, avoidance/numbing, and hyperarousal symptoms. This symptom structure has been extensively examined (Yufik & Simms, 2010) with most research supporting a 4-factor model including re-experiencing, avoidance, and hyperarousal factors with a 4<sup>th</sup> factor comprised either of numbing (King, Leskin, King, & Weathers, 1998) or dysphoric symptoms that include numbing symptoms. (Elklit & Shevlin, 2007; Simms, Watson, & Doebbeling, 2002; Yufik et al., 2010) The structure of these symptoms has been used to inform theory and diagnosis. However, most variable-centered approaches such as factor analysis assume that symptoms function in a consistent manner across individuals, an assumption that conflicts with the long history of typological frameworks (including the DSM-IV) in psychiatry (Allport, 1937; Meehl, 1979; Myers, McCaulley, & Most, 1985; Robins, John, Caspi, Moffitt, & Stouthamer-Loeber, 1996).

Person-centered approaches, including taxometric analysis, cluster analysis, and latent class analysis (LCA) methods, group *individuals* with covariation in the participants' variable responses; in contrast, variable-centered approaches group *variables* on the basis of covariation among variables (Bauer & Curran, 2004; Lubke & Muth  n, 2005; Muthen & Muthen, 2000). Simply put, person-centered approaches identify subgroups with similar patterns of symptom endorsement. Although a few taxometric analyses of PTSD have been conducted (Forbes, Haslam, Williams, & Creamer, 2005; Ruscio, Ruscio, & Keane, 2002), taxometric approaches may be problematic in PTSD studies which are often characterized by low base rates, non-normal indicator distributions, and fewer than five or six indicators (Beauchaine, 2009; Beauchaine & Marsh, 2006; Cole, 2004).

LCA may be less vulnerable to these factors and permits a flexible model specification as well as fit indexes that empirically inform decisions about the number of underlying classes (Pastor, Barron, Miller, & Davis, 2007). LPA, the approach applied in the present

investigation, is a subtype of LCA involving the incorporation of continuous indicators (severity of symptoms) to group classification. LPA compares individual profiles with respect to profile shape (qualitative differences) and symptom levels (quantitative differences). In other words, whereas LCA identifies subgroups with homogeneous yes/no endorsement of a particular set of symptoms, LPA distinguishes subgroups with homogeneous *severity* of the particular set of symptoms. To the degree that severity of PTSD symptoms is believed to be meaningful, LPA has the potential for a more refined categorization of individuals.

Breslau and colleagues (Breslau, Reboussin, Anthony, & Storr, 2005) were the first to apply LCA to the examination of DSM-IV PTSD symptoms in two large urban, community samples. Findings supported the presence of three classes of symptoms, described as no disturbance, intermediate disturbance, and pervasive disturbance. Unlike LPA, which may depict the *severity* of symptoms reported, LCA is limited to the *likelihood* that a symptom is or is not endorsed by class members. Accordingly, items were summarized across subscales as one way to explore configural support, with emotional numbing found to comprise a greater proportion of symptoms in the pervasive disturbance class. However, as numbing symptoms were also least prevalent in the sample, it is possible that these classes primarily reflect PTSD severity. Additionally, amnesia was excluded from the analysis due to low endorsement. This is notable given recent evidence from two LPAs that supported the presence of a dissociative subtype among individuals diagnosed with PTSD, pointing to the potential importance of including the amnesia item (Steuwe, in press; Wolf in press). Importantly, however, the inclusion of supplemental dissociation items in these LPAs limits conclusions about analyses focusing exclusively on PTSD symptoms. Latent class or profile analyses that use different symptoms can be thought of as akin to exploratory factor analyses of measures that include different items. The Breslau and colleagues LCA involved multiple strengths including the use of interviews administered in two large and diverse community samples.

The present investigation is the first LPA to focus exclusively on all possible DSM-IV PTSD symptoms. Analyses were conducted in a large trauma-exposed sample of African Americans (Binder et al., 2008; Bradley et al., 2008; Gillespie et al., 2009; Ressler et al., 2011). Given prior evidence for within-diagnosis heterogeneity, as well as questions about whether the two symptomatic classes in prior research actually evidence configural variation, we expected that LPA analyses in a large sample would permit sufficient power to identify more than three profiles. We expected that symptomatic profiles would be associated with higher levels of trauma and comorbidity as well as increased reports of clinically-significant symptoms and behaviors.

## METHODS

### Participant Recruitment

Participants were approached in the waiting rooms of primary care or obstetrical–gynecological clinics of Grady Memorial Hospital in Atlanta, GA. This investigation presents data from 2,915 African American study participants who reported exposure to a criterion A trauma and who completed the PTSD symptom assessment. Due to variable participant literacy, all self-report measures were administered through verbal interview. Each person was paid \$15 for participation. In addition, a subset of participants also completed a secondary phase of the study during which structured clinical interviews, including the Clinician Administered PTSD Scale (CAPS) and Structured Clinical Interview for DSM-IV (SCID-DSM-IV), were administered. Participants were paid \$60 for the secondary phase of the study. All participants who were interested in further research participation completed a form indicating their interests. They were then contacted by the

research study coordinators to determine interests and eligibility for further participation in research. Written and verbal informed consent was obtained for all participants. All procedures in this study were approved by the institutional review boards of Emory University School of Medicine and Grady Memorial Hospital.

## Assessment

**Demographics**—Participant demographics were collected during the initial assessment. This data include (but are not limited to) participant age, gender, self-identified race/ethnicity and household monthly income.

**The Traumatic Events Inventory (TEI)**—The TEI (Schwartz, Bradley, Sexton, Sherry, & Ressler, 2005) is a 14-item screen for history of traumatic events. For each traumatic event, the TEI assesses experiencing and witnessing separately. It also assesses confrontation of traumatic events where appropriate. The TEI also asks the number of times that each event has occurred; age at self-perceived “worst” instance for a given traumatic event; and feelings of helplessness or horror for each traumatic event.

**Childhood Trauma Questionnaire (CTQ)**—The CTQ (Bernstein, Ahluvalia, Pogge, & Handelsman, 1997; Bernstein et al., 1994) is a 28-item, self-report inventory assessing five types of maltreatment: sexual, physical and emotional abuse and emotional and physical neglect. Cutoff scores have shown excellent sensitivity and specificity in correctly classifying cases of abuse and neglect in psychiatric patients (Bernstein et al., 1997; Bernstein et al., 2003b). Multiple studies have established the internal consistency, stability over time and criterion validity of the CTQ (see, e.g., Bernstein et al., 2003a) The CTQ yields a total score and subscale scores for each of the 5 types of child abuse and neglect.

**Modified PTSD Symptom Scale (MPSS)**—The MPSS (Falsetti, Resnick, Resick, & Kilpatrick, 1993) is a psychometrically reliable 17-item self-report scale assessing PTSD symptomatology over the prior two weeks with a range from 0 to 51 (Coffey et al., 1998; Foa, Riggs, Dancu & Rothbaum, 1993; Foa & Tolin, 2000). Symptoms were rated on a 4-point scale (ranging from 0 = “not at all” to 3 = “5 or more times per week”) and, consistent with prior literature, were combined to reflect overall symptom severity (Binder, et al., 2008; Schwartz et al., 2006; Schwartz et al., 2005).

**Clinician Administered PTSD Scale (CAPS)**—The CAPS (Blake et al., 1995; Blake et al., 1990), an interviewer-administered diagnostic assessment of lifetime and current PTSD, has excellent psychometric properties (Blake et al., 1995; Weathers, Keane, & Davidson, 2001). Each of the 17 diagnostic criteria are rated using frequency and intensity scores which range from 0 (absent) to 5 (extremely severe). The CAPS score and diagnosis used here are anchored to the subjectively worst trauma (as judged by the subject). A frequency rating of 1 or higher paired with an intensity score of 2 or higher was scored for presence of the respective symptom (Blake et al., 1995; Blake et al., 1990).

**Structured Clinical Interview for DSM-IV (SCID DSM-IV)**—The SCID-DSM-IV (First, Spitzer, Gibbon, & Williams, 1998) is a validated interview of DSM-IV psychiatric disorders and was used to assess lifetime presence or absence of major depressive disorder (MDD) as well as alcohol and substance abuse and dependence disorders. MDD and substance abuse/dependence current and lifetime diagnoses were coded dichotomously (0=absent, 1=present). Psychotic symptoms were assessed using the psychosis screening module with endorsement of either sub-threshold or full symptoms judged to be present. We created dichotomous variable (0=absent, 1=present) with two groups those who no rated psychotic symptoms and those with either present or sub-threshold psychotic symptoms.

**Beck Depression Inventory (BDI)**—Depressive symptoms were assessed with the 21-item BDI, a commonly used continuous measure of level of depressive symptoms (Beck, Steer, & Carbin, 1988). Items were summed for an index of depressive symptom severity.

**History of Suicide Attempt and Psychiatric Hospitalization**—To assess for history of suicidality and hospitalizations, participants responded to the questions, “have you ever tried to kill yourself?” and “have you ever been hospitalized for psychiatric or mental health treatment?”

**Dissociative Experiences Scale-Taxon version (DES-T)**—Dissociative symptoms were assessed using a shortened (8-item) version of the DES-T (Bernstein & Putnam, 1986). Items were selected to best represent pathological levels of dissociation (Waller, Putnam, & Carlson, 1996).

**Connor Davidson Resiliency Scale (CD RISC)**—Resilience coping style was assessed using the CD-RISC (Campbell-Sills, Forde, & Stein, 2009; Campbell Sills & Stein, 2007; Connor & Davidson, 2003), a 25-item self-report questionnaire with statements such as “I tend to bounce back after hardship or illness” rated on a 5-point Likert-type scale. Higher scores reflect greater resilience.

### Analytic Plan

Descriptive statistics were explored using SPSS Version 15 and all other analyses were conducted using MPlus Version 6.1. LPA model estimation procedures applied maximum likelihood estimation with robust standard errors (MLR). Classification of respondents is based on estimated posterior probabilities that indicate the likelihood of each case belonging to each class. Model fit comparison statistics include the Lo Mendell Rubin (LMR) test (Lo, Mendell, & Rubin, 2001), Bayesian Information Criterion (BIC) and Aikake’s Information Criterion (AIC) indexes (Henson, Reise, & Kim, 2007; Magidson & Vermunt, 2004; Nylund, Asparouhov, & Muthen, 2007), and the parametric Bootstrapped Likelihood Ratio Test (BLRT) which has been found to outperform existing model comparison statistics (Nylund et al., 2007). PTSD symptoms were used as indicators of class membership.

We tested the relationship between estimated posterior latent class probability distributions and auxiliary variables using pseudo-class draws. The present approach of using pseudo-class draws does not include auxiliary variables in the initial creation of the classes but rather permits assessment of whether modeled classes were meaningfully related to key variables (i.e., childhood trauma, psychiatric diagnoses, and associated features). Described elsewhere (Bande-en-Roche, Miglioretti, Zeger, & Rathouz, 1997; Muthen & Asparouhov, 2007; Wang, Brown, & Bande-en-Roche, 2005), we used pseudo-class draws to sample from the multinomial distribution of posterior probabilities to permit comparisons of the means and variances across classes (Bande-en-Roche et al., 1997; Muthen et al., 2007; Wang et al., 2005). This approach is different than single-step regression procedures which include auxiliary variables in the determination of LPA classes, thereby potentially changing the interpretation of latent classes as a function of which auxiliary variables were selected. Statistical significance was defined as a p-value of less than .001. (For interested readers, a more technical account of the analytic approach and results may be found in the appendix.)

## RESULTS

Descriptive statistics are presented in Tables 1 and 2. Relative to nationally-representative samples (Cogle, Timpano, Sachs-Ericsson, Keough, & Riccardi, 2011; Pietrzak, Goldstein, Southwick, & Grant, 2011; Roberts, Gilman, Breslau, Breslau, & Koenen, 2011),

participants reported high levels of childhood and lifetime trauma and were more likely to meet current and lifetime criteria for PTSD (21% and 49%, respectively) and for current and lifetime major depression (18% and 43%).

### Model Selection

Table 3 summarizes model performance. The 6-profile solution provided the overall best fit across indices. The BLRT has better accuracy for identification of number of profiles and has been found to outperform all existing model comparison statistics (Nylund et al., 2007). Although the BLRT supported both 3- and 6-profile models, the 6-profile solution was found to be superior to the 3-profile solution across all other indexes. In particular, high entropy, as found in the 6-class solution, is particularly important for estimation of standard errors (Clark & Muthen, under review). Posterior probabilities for correct classification were also superior in the 6-class solution (.95–1.0) relative to the 3-class solution (.93–.97).. Additionally, whereas quantitative but not qualitative differences were found in the 3-profile plot, the six-profile plot (Figure 1) confirmed the presence of both qualitative and quantitative differences. The presence of qualitative differences is critical for practical and clinical purposes; in the absence of qualitative differences, estimated classes simply represent a continuous index of severity which may be better represented as a continuous unitary construct than as separate “classes”. Given some overall severity differences between profiles 2, 4, and 5 and profiles 3 and 6, we also examined average latent class probabilities for most likely class membership across these classes. The probability of being in a different profile than assigned by the model ranged from 0 to .04.

Profile 1 represents the majority of the sample (61%) and can be described as *resilient*. Profile 2 consisted of 5% of the sample and showed *moderate PTSD symptoms with marked amnesia*. Profile 4 was comprised of 6.9% of the sample and may be described to show *moderate PTSD symptoms with marked diminished interest*. Profile 5, 15.4% of the sample, evidenced *moderate PTSD symptoms without amnesia and diminished interest*. Profile 3 consisted of 4.4% of the sample and showed *severe symptoms overall*. Finally, Profile 6 consisted of 6.7% of the sample and showed *severe symptoms without amnesia*.

### Trauma Exposure, Diagnostic Correlates, and Associated Features

Table 4 presents means across classes and Wald tests of mean differences using posterior probabilities and pseudo-class draws. Whenever the Wald omnibus test of respective auxiliary variables is statistically significant, superscripts are provided to indicate significant differences between the respective classes.

## DISCUSSION

The present investigation extends an emerging literature of person-centered PTSD examinations and represents the first latent analysis of: (1) PTSD profiles, (2) all 17 DSM-IV PTSD symptoms, and (3) a large, African American sample with high rates of PTSD. These analyses provide important and novel insight into the heterogeneity of post-traumatic symptomatology, with implications for diagnosis, theory, and treatment. Consistent with prior LCA research (Breslau et al., 2005), the six estimated profiles could be further summarized such that they represented groupings of resilient (one profile), moderate (three profiles), and severe (2 profiles) symptoms. However, whereas prior research focusing on PTSD symptoms only excluded amnesia, our findings suggested that amnesia was critical to distinguishing unique profiles of PTSD within severe and moderate groupings. We observed three profiles characterized by *moderate symptoms* with endorsement of amnesia and diminished interest discriminating between these groups. Amnesia was also found to distinguish between our *severe without amnesia* and our *severe overall* profiles. Notably,

amnesia, which was reported by 16.3% of the sample, was the least frequently endorsed symptom in the present investigation.

Given consistency between our findings and those of Breslau and colleagues regarding the *resilient*, *moderate*, and *severe* subgroups, it would be natural to question whether a three group solution that collapses participants in the three *moderate* and two *severe* profiles into groups might best represent the data. However, estimated posterior probabilities did not support this possibility, suggesting that such lumping would not reflect the actual observed heterogeneity of profiles. Profile plots and fit indices support the present rubric of considering three severity groupings (resilient, moderate, and severe), with moderate and severe classes further comprised of heterogeneous profile subgroups.

To test theoretical and clinical implications of observed profiles, we examined the relationship between profile membership current and lifetime diagnoses and alcohol and drug abuse. Whereas few participants in the *resilient* profile met current or lifetime PTSD diagnosis, PTSD diagnoses were highest in the *severe overall* and the *severe without amnesia* profiles. Current PTSD did not differ among *moderate* or *severe* profiles. The *moderate with amnesia* profile did not differ significantly from any other profiles whereas the *moderate with diminished interest* profile was significantly lower than both *severe* profiles and the *moderate without amnesia and with diminished interest* profile was significantly higher than the *resilient* profile. A similar severity effect was observed for depression, as current and lifetime major depression were least common in the *resilient* profile and most common in the *severe* profiles. Interestingly, although the symptom of diminished interest was most prominent in the *moderate with diminished interest* profile relative to the other *moderate profiles*, this did not translate to a significant difference in likelihood of meeting lifetime or current MDD. This is particularly interesting given that the other *moderate classes* reported levels of diminished interest that were nearly as low as the *resilient* profile. Consistent with past research, the present investigation examined PTSD in participants with a broad range of PTSD symptom endorsement. Although sample size and measurement concerns precluded this strategy in our investigation, it would be interesting for future studies to test for the presence of latent profiles in samples with PTSD.

Symptoms of depression, emotional dysregulation, and negative affect further reinforced an overall severity effect. Specifically, lowest levels of depressive symptoms, emotional dysregulation, and negative affect symptoms were observed in the *resilient* profiles, followed by the three *moderate* profiles, and with the highest levels of depression, emotional dysregulation, and negative affect reported by both *severe* profiles. These findings fit with extant theories of depression, which posit centrality of negative affect and deficits in emotion regulation (Bradley et al.; Clark & Watson, 1991; Gross, 1998). Consistent with theories of positive psychology (Fredrickson, 2001), positive affect and resilience showed similar patterns of associations across profiles. Specifically, positive affect and resilience were highest in the *resilient* profile and lowest in the *severe, overall* profile.

Findings from the present investigation, particularly the key role of amnesia in discriminating class membership, supports prior evidence that dissociation plays an important role in posttraumatic stress. Two recent investigations conducted LPA using the combination of PTSD symptoms and additional dissociation symptoms (including depersonalization and derealization) (Steuwe, in press; Wolf, in press). Both investigations focused analyses on participants with clinically significant PTSD and both reported evidence for a dissociative subtype of PTSD, with the additional (non-DSM) dissociation symptoms distinguishing a dissociative subtype. Importantly, the Steuwe and colleagues (in press) investigation, a sample ( $n = 134$ ) of civilians who met diagnostic criteria for PTSD, did not include the PTSD amnesia item in analyses. The Wolf and colleagues (in press)

investigation involved two samples of veterans with PTSD ( $n = 260$  and  $284$ ) and examined all PTSD symptoms in combination with supplemental dissociation items (i.e., depersonalization, derealization, and reduction in awareness in Sample 1 and two depersonalization items and two derealization items in Sample 2). Interestingly, in both samples, the DSM-IV amnesia item did not distinguish between the high PTSD and dissociative subtypes. There are important differences between these investigations and the present analyses, including the use of only participants with diagnostic levels of PTSD, the use of smaller samples, and especially the use of different symptoms. However, it is remarkable that both studies reported an important role for dissociation symptoms in subtyping PTSD. Thus, these studies in combination with the present investigation contribute the understanding of dissociation as a component of PTSD and points to the need for further research related to the relationships among dissociation, amnesia and other PTSD symptoms. Although not statistically significant, we found that the *moderate with amnesia group* reported higher overall dissociation (mean = 99) as compared with the *moderate with diminished interest* (mean = 76) and *moderate without diminished interest* (mean = 87) groups. Interestingly, however, our data show that dissociation is associated primarily with overall level of severity of symptom profile. One possibility is that overall dissociation is related to levels of childhood abuse, which are higher in the two severe groups. Research and theory suggests that childhood maltreatment may be associated with a form of posttraumatic reaction marked by high levels of dissociation (Lanius, Brand, Vermetten, Frewen, & Spiegel, 2012). Alternatively, some participants may be endorsing qualitatively different forms of amnesia related to the trauma. For example, it is possible that some participants do not recall parts of the traumatic event due to traumatic amnesia which would be expected to correlated with dissociation whereas other participants do not recall parts of the traumatic event for medical reasons (i.e., head injury, rohypnol or other drug administration, etc). Yet another explanation for this finding could be related our use of a self-reported assessment of a unitary construct of dissociation. Recent work suggests that instruments measuring multiple aspects of dissociation are better than measures of dissociation as unitary construct (Briere, Weathers, & Runtz, 2005). Clearly this issue of the relationship between traumatic amnesia, dissociation and overall severity levels of PTSD symptom merits further research.

The data from the present study also point the importance of considering the role of diminished interest in PTSD. Although not statistically significant, both moderate groups with diminished interest (*moderate with diminished interest* and *moderate with no amnesia and diminished interest*) reported higher mean levels of depression (means = 19, 18) as compared with the *moderate with amnesia group* (mean = 17). It is surprising that we did not observe a greater difference in overall depression within the moderate and severe groups. However, it is notable that the means for depressive symptoms across the moderate groups fell above the threshold for mild depression and depressive symptoms for the severe groups fell well above the moderate depression cutoff (Beck, Steer, & Brown, 1996). These scores also fell well above the mean of 13 observed in another low income African American outpatient sample (Grothe et al., 2005). The absence of depression differences, particularly in the severe groups, may partially reflect ceiling effects of high comorbidity of PTSD and depression. It is also possible that even within groups of individuals with co-morbid PTSD and depression, there may be qualitative distinctions among individuals with diminished interests in activities. For example, there is evidence that over the course of PTSD, more fear-based avoidance symptoms may transform into habitual baseline lack of interest, restricted range of affect and disconnection from others (Stein & Paulus, 2009). In addition, lack of interest and associated lack of participation in activities may represent a non-trauma cue specific form of behavioral avoidance which might have the effect increased risk for more severe or more persistent PTSD and depression symptoms. Thus, lack of interest and associated lack of participation in pleasurable or social activities may be an important target



for intervention in some patients with PTSD (Beidel, Frueh, Uhde, Wong, & Mentrkoski, 2011).

History of hospitalization was most infrequently reported by participants in the *resilient* profile, followed by participants in the *moderate profiles*, and *severe* profiles. However, of particular clinical importance, whereas most profiles show correspondence in rates of prior hospitalization and suicide, participants in the *moderate with amnesia* profile were remarkably more likely to report a history of suicide attempt (26%) than a history of hospitalization (18%). Thus, the *moderate with amnesia* profile represents a subgroup of individuals at considerable unrecognized clinical risk. Further reinforcing the differential presentation of this subgroup, participants in the *moderate with amnesia* report highest levels of dissociation and lowest levels of depression and negative affect in comparison with the other *moderate symptom* profiles.

Taken together, the clinical implications of these findings are substantial. Whereas overall severity is often seen as the important outcome, our findings support important differences in subgroups with otherwise generally comparable levels of severity. In addition to differences in associated features tested here, the qualitative differences observed amongst the three moderate and two severe classes may have important implications for heterogeneity in underlying neurobiology and treatment response. Symptoms of amnesia and diminished interest served to distinguish subgroups within the moderate and severe classes. Future studies may further explore these important symptoms using longitudinal, neurobiological, or intervention designs. Neurobiological and intervention research has also pointed to the presence of a dissociative subtype of PTSD (Lanius et al., 2012).

Although we had data from additional non-African American participants, consistent with the focus of our overarching research program on understanding risk and resilience in a high-risk, low income, urban African American sample, 90% of our sample was African American. While focusing entirely on our African American sample limits generalizability, it permits a focal examination of a high-risk population that has been underrepresented by many diagnostic studies. Given the inherently exploratory nature of LPA, which uses observed data to estimate model parameters, independent replication of the latent classes identified here will be critical for future investigations. LPA assumptions of normality of mixture distributions and reliance on functional assumptions are important to acknowledge and, given this sensitivity, it is especially notable that present findings evidenced a degree of consistency with past research in LCA of PTSD. There are several alternative approaches to the data analysis we conducted (e.g., factor mixture models). These approaches may answer important complementary questions to those addressed in this manuscript. For example, some factor analytic work has suggested that amnesia does not tend to covary with other PTSD symptoms and is not heavily influenced by PTSD common factors. Factor mixture model approaches may help to explore the possibly unique role of amnesia in future investigations. Further discussion of this issue is beyond the scope of the current manuscript but it represents an important avenue for future research.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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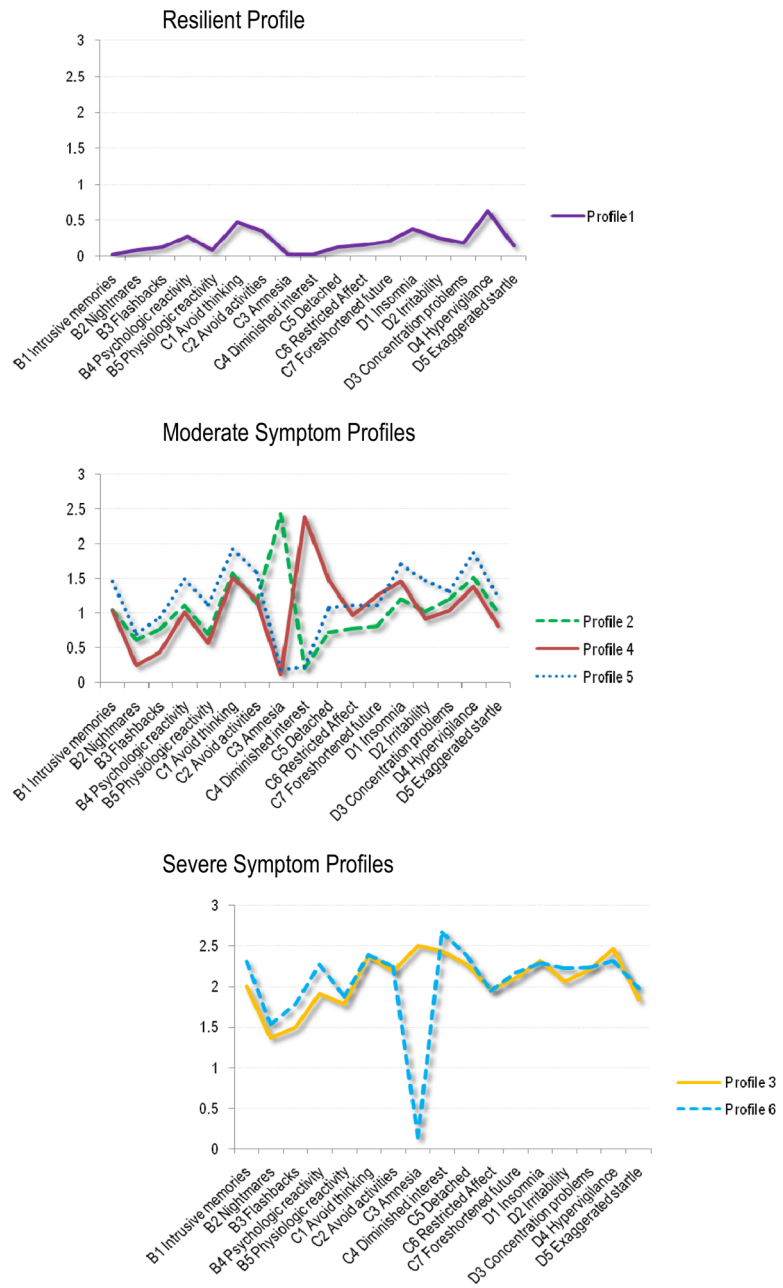


Figure 1.

Table 1

Descriptive statistics for sample included in analyses

	<b>M (SD)</b>	<b>Range</b>
Childhood Trauma		
Sexual Abuse	7.40 (4.81)	5–25
Physical Abuse	7.96 (3.88)	5–25
Emotional Abuse	8.62 (4.58)	5–25
Types of Trauma		
Count of Types of Trauma	3.88 (3.06)	0–16
Diagnostic Psychopathology		
Current PTSD	21%	NA
Lifetime PTSD	49%	NA
Current Depression	18%	NA
Lifetime Depression	43%	NA
Associated Features		
Suicidal Ideation	13%	
Depressive Symptoms	12.94 (11.70)	0–63
Emotional Dysregulation	74.93 (39.65)	24–168
Negative Affect	20.58 (8.99)	10–50
Positive Affect	37.51 (9.19)	10–50
Dissociative Symptoms	76.36 (115.43)	0–710
esilience	80.84 (17.11)	0–100

Note Ranges are not provided for diagnoses. Descriptives are provided using raw, rather than model-implied, data.

Table 2

## Participant endorsement of symptoms of PTSD

Symptom	Mean (SD)	0	1	2	3
B1 Intrusive memories	.74 (.106)	61.5	14.7	12.5	11.3
B2 Nightmares	.37 (.079)	78.8	9.3	8.0	4.0
B3 Flashbacks	.48 (.086)	71.3	14.9	8.7	5.2
B4 Psychologic reactivity	.76 (.103)	57.0	19.9	12.8	10.3
B5 Physiologic reactivity	.50 (.095)	74.9	7.8	9.6	7.7
C1 Avoid thinking	1.04 (.122)	51.7	14.2	12.9	21.2
C2 Avoid activities	.85 (.121)	62.5	9.5	8.7	19.3
C3 Amnesia	.30 (.076)	83.7	6.9	5.0	4.5
C4 Diminished interest	.51 (.099)	75.7	6.8	8.0	9.6
C5 Detached	.64 (.108)	70.3	7.6	9.8	12.3
C6 Restricted affect	.59 (.102)	71.4	8.7	9.8	10.2
C7 Foreshortened future	.66 (.110)	69.4	8.3	8.7	13.6
D1 Insomnia	.91 (.125)	62.0	5.4	12.0	20.6
D2 Irritability	.74 (.110)	64.5	9.8	31.1	12.5
D3 Concentration problems	.69 (.108)	66.3	9.3	13.0	11.5
D4 Hypervigilance	1.11 (.131)	54.2	7.5	11.1	27.2
D5 Exaggerated startle	.60 (.105)	72.1	7.4	9.3	11.2

Note: 0 = "not at all/only once", 1 = "once a week or less/a little bit/once in a while", 2 = "2-4 times per week/somewhat/half of the time", 3 = "5 or more times per week/very much/almost always"



**Table 3**

Model comparison statistics

	<b>AIC</b>	<b>BIC</b>	<b>Entropy</b>	<b>Smallest %</b>	<b>VLMR <i>p</i></b>	<b>LMR <i>p</i></b>	<b>BLRT <i>p</i></b>
Class 2	126047.47	126358.30	.96	26	.00	.00	.00
Class 3	122849.35	123267.78	.92	13	.00	.00	.00
Class 4	120509.15	121035.18	.97	9	.00	.00	.10
Class 5	119117.14	119750.77	.93	8	.00	.00	.00
Class 6	117870.65	118611.88	.97	4	.00	.00	.00
Class 7	116747.31	117596.13	.94	4	.00	.00	1.00

Table 4

Abuse History and Clinical Features for Each Class

CTQ Abuse Type	Class 1: Resilient		Class 2: Moderate, amnesia		Class 3: Severe, overall		Class 4: Moderate, diminished interest		Class 5: Moderate, no amnesia/diminished interest		Class 6: Severe, without amnesia	
	M	%	M	%	M	%	M	%	M	%	M	%
Sexual	6.55 <sup>2,3,5,6</sup>		9.01 <sup>1,3,6</sup>		11.22 <sup>1,4,5</sup>		7.41 <sup>3,6</sup>		8.10 <sup>1,3</sup>		9.48 <sup>1,4</sup>	
Physical	7.11 <sup>2-6</sup>		9.71 <sup>1</sup>		10.39 <sup>1</sup>		8.75 <sup>1,6</sup>		8.77 <sup>1,6</sup>		10.72 <sup>1,6</sup>	
Emotional	7.37 <sup>2-6</sup>		10.19 <sup>1,3</sup>		12.64 <sup>1,2,4,5</sup>		9.73 <sup>1,3,6</sup>		10.15 <sup>1,3,6</sup>		11.96 <sup>1,4,5</sup>	
Sex/Physical/Emotional	.36 <sup>2-6</sup>		.90 <sup>1</sup>		1.17 <sup>1,4,5</sup>		.74 <sup>1,3</sup>		.77 <sup>1,3,6</sup>		1.02 <sup>1,5</sup>	
<b>Diagnoses</b>	%		%		%		%		%		%	
Current PTSD	7.8 <sup>3,5,6</sup>		26.8		53.6 <sup>1,4</sup>		17.8 <sup>3,6</sup>		32.7 <sup>1</sup>		53.6 <sup>1,4</sup>	
Lifetime PTSD	32.8 <sup>2,3,5,6</sup>		60.9 <sup>1</sup>		83.4 <sup>1</sup>		55.5		63.8 <sup>1</sup>		80.5 <sup>1</sup>	
Current MDD	7 <sup>3,4,6</sup>		26.4		48.6 <sup>1</sup>		36.1 <sup>1</sup>		18.9		42.6 <sup>1</sup>	
Lifetime MDD	27.8 <sup>3-6</sup>		51.2		82.9 <sup>1,5</sup>		66.6 <sup>1</sup>		54.4 <sup>1,3</sup>		65.6 <sup>1</sup>	
Current Alcohol/Drug <sup>a</sup>	13.8		7.5		20.6		11.7		17.4		10.6	
Lifetime Alcohol/Drug	51.8 <sup>3</sup>		59.9		86.3 <sup>1,5</sup>		69.6		56.2 <sup>3</sup>		68.3	
Psychotic <sup>a</sup>	6.8		7.7		25.5		11.8		15.9		27.1	
<b>Associated Features</b>	M		M		M		M		M		M	
Dissociation	48.78 <sup>3,5,6</sup>		98.66 <sup>3</sup>		222.05 <sup>1,2,4,5</sup>		76.21 <sup>3</sup>		86.55 <sup>1,3</sup>		145.52 <sup>1</sup>	
Depressive Symptoms	7.95 <sup>2-6</sup>		16.68 <sup>1,3,6</sup>		29.58 <sup>1,2,4,5</sup>		19.09 <sup>1,3,6</sup>		18.49 <sup>1,3,6</sup>		29.31 <sup>1,2,4,5</sup>	
Emotional Dysregulation	60.97 <sup>2-6</sup>		87.42 <sup>1,3,6</sup>		118.93 <sup>1,2,4,5</sup>		87.04 <sup>1,3,6</sup>		94.35 <sup>1,3,6</sup>		117.94 <sup>1,2,4,5</sup>	
Negative Affect	17.60 <sup>2-6</sup>		22.79 <sup>1,3,6</sup>		30.16 <sup>1,2,4,5</sup>		23.77 <sup>1,3,6</sup>		24.14 <sup>1,3,6</sup>		29.94 <sup>1,2,4,5</sup>	
Positive Affect	38.87 <sup>3-6</sup>		37.49 <sup>1,6</sup>		34.22 <sup>1</sup>		34.34 <sup>1</sup>		36.54 <sup>1,6</sup>		33.52 <sup>1,2,5</sup>	
Resilience	84.25 <sup>3-6</sup>		79.06 <sup>6</sup>		72.75 <sup>1</sup>		77.27 <sup>1</sup>		79.21 <sup>6</sup>		71.07 <sup>1,2,5</sup>	
Hospital	.09 <sup>3-6</sup>		.18 <sup>3,6</sup>		.41 <sup>1,2,4,5</sup>		.19 <sup>1,3,6</sup>		.17 <sup>1,3,6</sup>		.34 <sup>1,2,4,5</sup>	
Suicide	.08 <sup>2-6</sup>		.26 <sup>1</sup>		.35 <sup>1,5</sup>		.20 <sup>1,6</sup>		.18 <sup>1,3,6</sup>		.36 <sup>1,4,5</sup>	

Note. Numbered superscripts are used to indicate significant differences between each class and the class numbers indicated.

<sup>a</sup> nonsignificant omnibus test