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Attachment organization in Vietnam combat veterans with posttraumatic stress disorder

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Attachment organization in a combat-related PTSD sample was investigated and compared with previously published clinical and non-clinical samples. The association between insecure attachment and unresolved mourning classification (U-loss) and between U-loss and PTSD symptoms was investigated. Vietnam combat veterans diagnosed with PTSD and in treatment ($N = 48$) were administered the Adult Attachment Interview, the SCID-IV, and CAPS. The PTSD sample was like non-clinical samples in the incidence of secure attachment (50%), but were more commonly unresolved. Veterans with insecure attachment organizations were more likely than those with secure attachment to be classified U-loss. U-loss classification was associated with greater likelihood of comorbid anxiety disorders and PTSD avoidance/numbing symptoms. The results suggest that while insecure attachment organization is associated with unresolved mourning in response to loss, it is not differentially associated with combat-related PTSD. The relationship between U-loss and PTSD is discussed in light of current literature.

Keywords: attachment organization; posttraumatic stress disorder; combat veterans; Adult Attachment Interview; unresolved loss

Introduction

Posttraumatic stress disorder (PTSD) is a significant problem estimated to affect over half a million veterans in the USA (Magruder et al., 2004), with additional cases being identified among veterans of Afghanistan and Iraq (Hoge, Castro, Messer, McGurk, Cotting, & Koffman, 2004; Hoge, Auchterlonie, & Milliken, 2006). Unfortunately, efforts to prevent and treat combat-related PTSD effectively are hindered by an incomplete knowledge of basic psychological mechanisms underlying its development. Individual differences which may have a profound effect on the response to trauma and the development of PTSD have not been adequately addressed.

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Attachment organization

Attachment theory is a model that has considerable promise for elucidating some of these individual differences (Maunder & Hunter, 2001; Sable, 1995; Stovall-McClough & Cloitre, 2006). The attachment behavioral system is a biologically-based system emerging during early development and shaped by parental behavior, temperamental characteristics of the infant, and environmental factors (Bowlby, 1969/1982). Networks of cognitive and emotional representations, termed internal working models of attachment or attachment organizations, underlie patterns of attachment behavior. Attachment organization plays an important role in adult human behavior by determining predictable individual differences in the regulation of affective arousal, attentional processes, and behavioral responses. As a system which functions to maintain safety, attachment organization is particularly activated under circumstances of perceived threat, danger, or loss, all of which are elements of traumatic experience. In addition to playing a pivotal role in the immediate response to trauma, attachment organization may contribute to the development of PTSD by determining individual differences in processing and coping strategies for managing intrusive symptoms and physiological arousal following exposure to trauma.

Operationalizing attachment organization

The Adult Attachment Interview (AAI; George, Kaplan, & Main, 1985; Main & Goldwyn, 1991; Main, Goldwyn, & Hesse, 2002) was developed to reliably assess attachment organization. The AAI is a semi-structured clinical interview exploring childhood attachment relationships, experiences of separation, loss, and trauma, and the way these experiences are currently understood. Interviews are coded for both content and discourse characteristics, allowing for an assessment of non-conscious elements of attachment organization. There are three major classification categories: secure/ autonomous, insecure/dismissing, and insecure/pre-occupied. In addition to being classified in one of these three major categories, transcripts are also categorized as to whether they are considered unresolved/disorganized (U/d) with respect to loss or trauma. Thus transcripts are classified in two ways, first as belonging to one of the three major classifications, and second as being unresolved/disorganized (U/d) or not. Normative data for non-clinical males has been provided by a large meta-analytic study of empirical research that utilizes the AAI (van IJzendoorn & Bakermans-Kranenburg, 1996).

Attachment organization and psychopathology

Attachment organization has been found to be associated with psychopathology (Dozier, Stovall, & Albus, 1999; Minde & Benoit, 1991). Insecure attachment organizations (both insecure/dismissing and insecure/pre-occupied) and U/d attachment have a higher incidence in psychiatric samples than non-psychiatric samples (e.g., Dozier et al., 1999; Fonagy et al., 1996; Patrick, Hobson, Castle, Howard, & Maughan, 1994; van IJzendoorn & Bakermans-Kranenburg, 1996). Fonagy et al. (1996) examined attachment organization in anxiety disorders by administering the AAI to 44 non-psychotic, psychiatrically hospitalized adults diagnosed with an anxiety disorder. In a three-way classification, there were significantly fewer secure attachment organizations and much more frequent insecure/pre-occupied attachment when compared to published non-clinical samples. In addition, very high rates of U/d classification relative to trauma or loss were found in the sample. This study suggests that anxiety disorders are associated with higher rates of insecure/pre-occupied attachments and higher rates of U/d classification.

There is also longitudinal data from children to support an association between insecure attachment organizations in childhood and later psychopathology (e.g., Carlson, 1998; Warren, Huston, Egeland, & Sroufe, 1997). However, the nature of the relationship between attachment organization and psychopathology, in terms of possible influences across development, is not yet clear.

Insecure attachment and U/d classification

While both insecure (dismissing and pre-occupied) and U/d attachment are believed to be associated with various forms of psychopathology, the relationship between these attachment organizations is not entirely understood. In the AAI, all individual transcripts are first classified into one of the three main attachment categories. Classification as U/d is based on evidence of a lack of full integration of trauma or loss experiences (Main & Hesse, 1990). Theoretically, secure/autonomous attachment represents the most flexible strategy for managing both external and internal experience, and thus may provide some measure of protection against difficulties fully integrating traumatic experiences. van IJzendoorn, Schuengel, and Bakermans-Kranenburg (1999) examined 20 studies of children across 24 samples, and found that for those classified as U/d, insecure attachment organizations were overrepresented. This relationship is often evident in studies of adults with psychopathology (Dozier et al., 1999), but has not been examined among adults with PTSD, and may be particularly germane to understanding risk for the development of PTSD following adult traumatic experiences in a combat zone.

Attachment organization and PTSD

Two empirical studies to date have examined attachment organization and PTSD. Turton, Hughes, Fonagy, and Fainman (2004) found no significant association between U/d responses to loss and PTSD in a sample of women who had experienced stillbirth. More recently, Stovall-McClough and Cloitre (2006) studied 60 women with histories of childhood physical or sexual abuse, both with and without PTSD. In both the sample as a whole and among those women diagnosed with PTSD, U/d responses to trauma (U-trauma) were overrepresented, while secure attachment organization was much less common when compared to non-clinical samples. Further, they found that women who were classified as U-trauma were 7.5 times more likely to be diagnosed with PTSD. A relationship between U-trauma and particular symptoms of PTSD, notably intrusive symptoms and avoidance/numbing symptoms, has been described by several attachment researchers (Fearon & Mansell, 2001; Lyons-Ruth & Block, 1996; Turton et al., 2004). Among women with a history of childhood abuse, U-trauma classification was associated with higher overall PTSD symptom severity than insecure/dismissing attachment. Higher levels of avoidance symptoms were associated with U-trauma in comparison with secure/autonomous organization (Stovall-McClough & Cloitre, 2006). An association between U/d attachment and PTSD has not been examined in veterans with combat-related PTSD.

Attachment organization and comorbid psychopathology

There is evidence that U/d classification is associated with increased psychiatric comorbidity (van IJzendoorn & Bakermans-Kranenburg, 1996). Stovall-McClough and Cloitre (2006) found that U-trauma relative to childhood abuse was associated with increased Axis I diagnoses and increased diagnosis of anxiety disorders.

Purpose

The purpose of this study was threefold. As a first step, we compared attachment organization in a sample of combat veterans with PTSD to published non-clinical and clinical samples. We predicted that in a forced three-way analysis, our PTSD sample would be significantly different from non-clinical samples in the literature and similar to an anxiety disorders sample. Further, we expected to find higher rates of U/d classifications than has been found in non-clinical samples and similar rates to that reported for an anxiety disorders sample (Fonagy et al., 1996) and for a female sample with PTSD secondary to childhood trauma (Stovall-McClough & Cloitre, 2006). Second, we examined the relationship between secure and insecure attachment organizations and the likelihood of being classified as U/d, predicting that those with insecure attachment organizations would be more likely to be also classified as U/d. Third, the association between U/d attachment, PTSD severity, and comorbid psychopathology was explored. Our initial hypotheses were that individuals classified as U/d would have more comorbid Axis I diagnoses, and more severe PTSD. Following recent results by Stovall-McClough and Cloitre, we also tested the hypothesis that U/d attachment would be related to severity of avoidance symptoms, but not symptoms of re-experiencing or hyperarousal.

Method

Participants and procedures

Vietnam combat veterans ($N = 50$) were recruited from the New Mexico Veterans Affairs Health Care System (NMVAHCS) PTSD/Trauma Clinic through clinic providers and posted advertisements. Volunteers were initially screened by telephone. Only those who served in the Vietnam combat zone, verified by discharge papers, and had a diagnosis of PTSD secondary to combat trauma, as documented in official VA medical records, were eligible for the study. Exclusionary criteria included a history of a psychotic disorder based on the veteran's medical record, current psychotic symptoms as assessed by the Structured Clinical Interview for Axis I DSM-IV-TR Diagnoses (SCID; First, Spitzer, Gibbon, & William, 2001) and evidence of neurologic dysfunction causing significant cognitive deficits as indicated either in the medical record or as observed during the initial research session. Because there is some risk that prior psychological treatment which includes exploration of early history or intra-psychic experience may bias responding in the AAI, veterans who had participated in this kind of psychotherapy within the last 5 years were ineligible for the study.

The study was approved by the Institutional Review Board for the NMVAHCS and informed consent was obtained individually from each participant. Participants were evaluated in two individual research sessions within 4 weeks. In the initial session they provided demographic and historical data and completed the SCID, the Clinician-Administered PTSD Scale and the Combat Exposure Scale, described below. The second session included administration of the AAI and debriefing.

Measures

Demographics

Demographic information including age, race/ethnicity, branch of military service, service-connected disability status, history of mental health treatment, and current psychiatric

medications was obtained through interview. Educational attainment, marital status, and occupation were obtained from medical records.

PTSD severity

The Clinician-Administered PTSD Scale (CAPS; Blake et al., 1998) was used to assess PTSD symptoms. In addition to a total severity score, the CAPS produces subscale scores for re-experiencing, avoidance and numbing, and hyperarousal symptoms. The CAPS has high internal consistency (Blake et al., 1995) and inter-rater reliability between trained raters, and correlates well with other measures of PTSD (Blanchard, Hickling, & Buckley, 1996; Blanchard, Jones-Alexander, & Buckley, 1996; Hovens, van der Ploeg, & Klaarenbeek, 1994).

Comorbid diagnoses

The Structured Clinical Interview for Axis I DSM-IV-TR Diagnoses (SCID; First et al., 2001) was utilized to identify co-morbid DSM-IV psychiatric diagnoses. Inter-rater reliability and validity for earlier editions of the SCID, while varying across populations, has been found to be adequate (Segal, Hersen, & Van Hasselt, 1994; Steiner, Tebes, & Sledge, 1995).

Trauma exposure

Participants' degree of exposure to combat trauma was assessed with the Combat Exposure Scale (CES; Keane, Fairbank, Caddell, Zimmering, Taylor, & Mora, 1989). The CES is a 7-item scale developed to assess exposure to potentially traumatic combat-related events. Good internal consistency and excellent test–retest reliability has been demonstrated (Keane et al., 1989).

Attachment organization

Attachment organization was assessed with the Adult Attachment Interview (AAI; Main et al., 2002). The AAI is psychometrically strong as evidenced by good test–retest reliability, stability, and both discriminant and predictive validity (Bakermans-Kranenburg & van IJzendoorn, 1993; Benoit & Parker, 1994; Crowell et al., 1996; Sagi, van IJzendoorn, Scharf, Koren-Karie, Joels, & Mayseless, 1994). For reviews see Hesse (1999) and van IJzendoorn and Bakermans-Kranenburg (1996).

The AAI was administered and audiotaped by one of the first two authors. Audiotapes were transcribed and coded for both content and discourse characteristics, including discourse coherency and linguistic patterns. This allows for assessment of non-conscious elements of attachment organization, resulting in multiple continuous subscale scores both for estimated actual experiences and current thought processes with respect to those experiences. Continuous scores for subscales lead to classification of attachment organization into one of three main categories: secure/autonomous, insecure/dismissing, and insecure/preoccupied. In addition, participants were assigned a U/d (unresolved/disorganized) score based on evidence of disorganization when discussing loss or trauma, including lapses in the monitoring of reasoning (e.g., speaking of a dead person as if they were still living or confusion regarding where and when the traumatic event occurred), lapses in monitoring discourse (e.g., interference of sensory experience of the trauma,

evidence of absorption), and reports of extreme reactions relative to loss or trauma. Consistent with AAI standardized scoring procedure, all participants assigned a U/d score above 5 (on a 1 to 9 scale) were classified as U/d, and scores of 5 were occasionally assigned to the U/d category based on consensus among several certified coders. The ''cannot classify'' (CC), a relatively new classification used in the AAI that describes individuals who are unable to put forth a single coherent model of past experience, was also utilized in this study. As is current practice, CC transcripts were included in the U/d classification in statistical analyses.

The first author coded all transcripts, and a randomly selected 25% of the study transcripts were coded by three of the authors. All were trained in the use of the AAI by the developers of the instrument's coding system, Mary Main and Erik Hesse, had successfully completed the 18-month AAI reliability check, and were certified. Inter-rater reliability was determined by calculating joint probability of agreement. Across three-way classification, inter-rater reliability was 83.3%. Inter-rater reliability for unresolved/disorganized classification was 91.6%. Inter-coder disagreements were resolved by discussion until consensus was reached. In the administration of the AAI in this study, standard protocol was followed and combat zone traumatic experiences were not specifically queried.

Results

Characteristics of the sample

Demographics and psychiatric status

Of the 50 participants enrolled in the study, two did not complete the second research session. Demographic information for the 48 who completed the study is displayed in Table 1. All 48 male participants had served in some capacity in the Vietnam theatre. The majority of the sample was receiving service-connected disability for PTSD (84%), with an additional 6% receiving service-connected disability for another mental health condition. Of those participants receiving service-connected disability for PTSD, only one was rated at less than 50% disabled. All participants had received some form of mental health treatment beyond psychiatric medication management in the NMVAHCS PTSD clinic. At the time of study participation, 82% of the sample was taking a psychiatric medication, the most common being tricyclic antidepressants (48%), SSRIs (42%), and benzodiaze-pines (36%).

All study participants had received full mental health assessments through the NMVAHCS PTSD/Trauma Clinic within the last 5 years, and had been diagnosed with chronic PTSD secondary to combat exposure. Participants were administered the CAPS to assess current PTSD symptoms. Mean total score on the CAPS was 68.1 ($SD = 28.3$). Although there was a wide range of total CAPS scores (0 to 116), the majority of the sample (67%) scored in the severe to extremely severe range. Seven participants did not meet full criteria for a current diagnosis of PTSD. As we wanted the sample to reflect the broad range of presentation and severity seen among combat veterans in the NMVAHCS, these individuals were retained in all analyses unless otherwise specified.

There was a high rate of psychiatric comorbidity in the sample (Table 1). Using the SCID to assess other Axis I diagnoses, all participants had at least one lifetime co-morbid diagnosis. Median number of additional Axis I diagnoses was three, mode was two, with a range of one to seven. Most common diagnoses were major depression (90%), alcohol dependence (69%), any other anxiety disorder (52%), panic disorder (40%), and substance dependence (21%).

Table 1. Descriptive information for total sample and by three main attachment classifications.[1]

	Total sample $N = 48$	Secure/ Autonomous $N = 24$	Insecure/ Dismissing $N = 13$	Insecure/ Pre-occupied $N = 11$
Mean age (years)[2]	57.7 (3.8)	57.1 (3.2)	58.3 (3.4)	58.2 (5.5)
Ethnicity (%)				
White	54%	50%	69%	55%
Hispanic	32%	29%	31%	27%
African American	4%	4%	-0-	9%
Native American	2%	4%	-0-	-0-
Other	8%	13%	-0-	9%
Mean education (years)[2]	13.3 (2.0)	13.5 (2.2)	13.5 (2.1)	12.4 (1.3)
Marital status (%)				
Married	63%	58%	54%	82%
Divorced	29%	33%	31%	18%
Never married	6%	8%	8%	-0-
Widower	2%	-0-	8%	-0-
Employment status (%)				
Full time	25%	25%	39%	9%
Part time	10%	13%	-0-	18%
Not working	65%	62%	61%	73%
Combat exposure[2]				
Mean CES score	25.1 (7.8)	23.5 (8.1)	25.9 (8.3)	27.4 (6.6)
Comorbid Axis I Diagnoses				
Mean # diagnoses[2]	3.3 (1.5)	3.4 (1.7)	3.0 (1.5)	3.4 (1.3)
Depression	90%	96%	85%	82%
Dysthymia	19%	30%	8%	9%
Panic disorder	40%	33%	31%	64%
Any anxiety disorder	52%	42%	46%	82%
Alcohol dependence	69%	79%	54%	64%
Substance dependence	21%	30%	8%	18%

Note: [1]No significant group differences on any measure. [2]Mean with standard deviation in parentheses.

Attachment classifications

In a forced three-way classification of the 48 participants who completed the AAI, 50% were classified as secure/autonomous, 27.1% as insecure/dismissing, and 22.9% as insecure/pre-occupied. There were no significant differences among the three groups on any of the demographic or historical variables (Table 1). Of the 48 completed AAI transcripts, 50% were classified as U/d based on U/d score ($n = 23$) or CC classification ($n = 1$). Participants with transcripts classified as U/d were compared with those whose transcripts were not so classified on the demographic and historical variables (Table 2). The only significant between-groups difference on these variables was for employment status, with significantly more unemployment among individuals whose transcripts were classified as U/d, $x^2 = 7.4$ ($df = 2, p < .03$).

Of the 23 participants classified as U/d, 48% (11) were so classified based on U/d scores for unresolved loss only, 35% (8) based on U/d scores for both unresolved loss and childhood trauma, and 17% (4) based on scores for childhood trauma alone. Thus, of those participants' transcripts classified as unresolved/disorganized, 83% provided clear evidence of unresolved mourning (U-loss). Of those four participants who were assigned

Table 2. Descriptive information for U-loss vs. Not U-loss classification groups.

	U-loss $N = 24$	Not U-loss $N = 24$
Mean age (years)[1]	57.9 (4.5)	57.4 (3.2)
Ethnicity (%)		
White	67%	46%
Hispanic	21%	38%
African American	4%	4%
Native American	-0-	4%
Other	8%	8%
Mean education (years)[1]	12.8 (1.9)	13.7 (2.0)
Marital status (%)		
Married	75%	50%
Divorced	21%	38%
Never married	4%	8%
Widower	-0-	4%
Employment status (%)		
Full time	13%	38%
Part time	4%	17%
Not working	83%	46%*
Combat exposure[1]		
Mean CES score	25.8 (7.3)	24.4 (8.4)
Comorbid Axis I diagnoses		
Mean # diagnoses[1]	3.5 (1.3)	3.1 (1.7)
Depression	92%	88%
Dysthymia	25%	13%
Panic disorder	54%	25%[†]
Any anxiety disorder	67%	38%[‡]
Alcohol dependence	67%	71%
Substance dependence	17%	25%

Note: [1]Mean with standard deviation in parentheses. *Significant group difference, $x^2 = 7.4$ ($df = 2, p < .03$). [†]Significant group difference, $x^2 = 4.3$ ($df = 1, p < .04$). [‡]Significant group difference, $x^2 = 4.1$ ($df = 1, p < .04$).

the U/d category based on childhood trauma U/d scores alone, three also reported significant childhood loss and were assigned a U/d score between 4 and 5, and the remaining participant declined to provide information on childhood loss. The single transcript classified U/d based on CC score also reported a significant childhood loss which had been assigned a U/d score of 4.0. As significant loss, most often with evidence of unresolved mourning, was common to all U/d transcripts, this group was considered as primarily providing evidence of unresolved loss (U-loss), and all such transcripts were included in analyses, unless otherwise stated.

Tests of hypotheses

Distribution across three main attachment classifications

First, a comparison was made between our PTSD sample and non-clinical samples derived from published meta-analysis of non-clinical fathers (van IJzendoorn & Bakermans-Kranenburg, 1996). A 3 (attachment organization) x 2 (sample) chi-square test revealed no significant difference (Table 3). The distribution of our PTSD sample across the three

attachment organizations (secure/autonomous, insecure/dismissing, and insecure/pre-occupied) was very similar to that reported for non-clinical male samples. There was no support for the hypothesis that our PTSD sample's attachment organization distribution was significantly different from the published non-clinical samples. Our PTSD sample was next compared to a published anxiety disordered sample (Fonagy et al., 1996). We expected similar high rates of insecure/pre-occupied attachment organization in both samples. A 3x2 chi-square test comparing the samples was significant, $x^2 = 18.5$ ($df = 2$, $p < .001$), indicating that contrary to expectation, the PTSD sample's attachment organization distribution was different from a published anxiety disorders sample (Table 3), with higher rates of secure attachment. A comparison to the sample of females with histories of childhood abuse (Stovall-McClough & Cloitre, 2006) was not possible, as three-way classification data for that sample has not been provided.

U/d classification relative to trauma or loss

The same comparisons were made for incidence of U/d vs. not U/d transcripts with the additional comparison to the sample of women with PTSD (Stovall-McClough & Cloitre, 2006). It was predicted that there would be higher rates of U/d classification in our PTSD sample than in the non-clinical sample, but similar rates would exist between our PTSD sample and both clinical samples. As can be seen in Table 4, our PTSD sample had a significantly higher incidence of U/d classification (U-loss) than the non-clinical sample,

Table 3. Distributions of three-way AAI classifications.

		AAI classification		
Sample	n	Secure/ Autonomous	Insecure/ Dismissing	Insecure/ Pre-occupied
Non-clinical fathers[a]	286	61.9%	22.0%	16.1%
Combat veterans with PTSD	48	50.0%	27.1%	22.9%*
Adults with anxiety disorders[b]	44	15.9%	18.2%	65.9%*

Note: [a]van IJzendoorn & Bakermans-Kranenburg, 1996. [b]Fonagy et al., 1996. *Significant distribution differences between marked studies, $x^2 = 18.5$ ($df = 2$, $p < .001$).

Table 4. AAI classification as U/d with respect to loss or trauma.

		AAI classification	
Sample	n	Unresolved/ Disorganized	Not Unresolved/ Disorganized
Non-clinical fathers[a]	286	16.6%	83.4%*
Combat veterans with PTS (U-loss)	48	50.0%	50.0%*†
Adults with anxiety disorders[b]	44	86.4%	13.6%†
Women with PTSD[c] (U-trauma)	30	63.3%	36.7%

Note: [a]van IJzendoorn & Bakermans-Kranenburg, 1996. [b]Fonagy et al., 1996. [c]Stovall-McClough & Cloitre, 2006. *Significant distribution differences between marked studies, $x^2 = 25.9$ ($df = 1$, $p < .001$). †Significant distribution differences between marked studies, $x^2 = 13.8$ ($df = 1$, $p < .001$).

$x^2 = 23.0$ ($df = 1$, $p < .001$), supporting the hypothesis. Furthermore, there was no significant difference between our PTSD sample and the sample of women with PTSD, again supporting our hypothesis. In contrast, the study sample had fewer U/d classifications than the anxiety disorders sample, $x^2 = 13.8$ ($df = 1$, $p < .001$), indicating that contrary to expectation, the study sample's incidence of U/d classification was also significantly different than the anxiety disorders sample.

Insecure attachment organizations and U-loss classification

Differences in the U/d score across the three attachment groups in our sample was examined using Analysis of Variance (ANOVA). There were significant group differences, $F(2, 45) = 5.50$, $p < .007$ (Table 5). Scheffé post-hoc contrasts found a significant difference in U/d scores between the secure/autonomous group and the insecure/pre-occupied group only ($p < .01$). In addition, a significant 2 (secure/insecure) x 2 (U-loss or not) chi-square test (Table 3), $x^2 = 4.09$, ($df = 1$, $p < .043$), showed that the insecure group was more likely to be classified as U-loss than the secure group. This finding supports the hypothesis that insecure attachment organizations were more likely to also be classified as U/d (U-loss in the study sample).

U-loss classification and co-morbid diagnoses

Contrary to our hypothesis, there was no difference in mean number of comorbid Axis I diagnoses between individuals classified as U-loss ($M = 3.5$, $SD = 1.3$) and those not so classified ($M = 3.1$, $SD = 1.7$). Using a series of chi-square tests to examine the relationship between U-loss classification and likelihood of having particular psychiatric diagnoses, those classified as U-loss were significantly more likely to be diagnosed with an additional anxiety disorder, $x^2 = 4.1$ ($df = 1$, $p < .04$), or specifically with panic disorder, $x^2 = 4.3$ ($df = 1$, $p < .04$). There were no between group differences for likelihood of diagnosis with depression, dysthymia, or alcohol or substance use disorders (Table 2).

U-loss classification and PTSD

Differences in the CAPS total severity score between the U-loss and the no U-loss groups were examined using ANOVAs. There were no significant group differences. Differences between the groups on CAPS re-experiencing, hyperarousal, and avoidance and numbing subscale scores were also explored using ANOVA, and again no between group differences were found. ANOVAs on CAPS scores were undertaken a second time, this time deleting from the sample those veterans ($N = 7$) who did not meet criteria for current PTSD.

Table 5. U-loss classification across AAI three-way classifications.

AAI classification	N	U/d score mean (SD)	% Classified as U-loss[†]
Secure/Autonomous	24	4.25* (1.59)	33.3%
Insecure/Dismissing	13	5.77 (2.74)	61.5%
Insecure/Pre-occupied	11	6.50* (1.82)	63.6%

Note: Overall difference in mean U/d scores was significant, $F(2, 45) = 5.50$, $p < .007$. *Insecure/pre-occupied significantly greater U-loss than secure/autonomous (Scheffé post-hoc contrasts, $p < .01$). [†]2x2 chi-square test (secure/insecure and U-loss/not U-loss) $x^2 = 4.09$, ($df = 1$, $p < .04$).

There were no between group differences on the CAPS total severity score, re-experiencing subscale score or hyperarousal subscale score. However, there was a significant between groups difference on CAPS avoidance/numbing subscale score, $F(1, 39) = 4.2$, $p < .05$ (Table 6), with individuals classified as U-loss scoring somewhat higher on this subscale. Therefore, analyses restricting participants to only those meeting current criteria for PTSD provided support for an association between U-loss attachment and PTSD avoidance/numbing symptoms.

Post-hoc analyses: loss, childhood abuse, and PTSD

Several exploratory post-hoc analyses were undertaken to further examine possible relationships between U/d classification and PTSD. Considering loss, 79% (38) of the entire sample reported significant childhood loss. Of these, 53% (20) were classified as U-loss. Restricting the sample to only those participants reporting significant childhood loss, comparisons were undertaken between the U-loss group and the not-unresolved group. ANOVAs on CAPS scores were again conducted, and no between group differences were found. Experiences meeting AAI criteria for childhood abuse were reported by 42% (20) of the participants. Of these, 70% (14) were classified as U-trauma and 30% (6) were not so classified. Because 38% (18) of the sample reported both significant childhood loss and childhood trauma, separating the impact of these experiences is problematic. Due to small cell sizes and inadequate power, additional more fine-grained analyses were not pursued.

Table 6. CAPS total severity and avoidance/numbing scores.

	N	Total severity	Re-experiencing	Avoidance/Numbing	Hyper-arousal
Total sample					
U-loss	24	68.9 (28.2)	14.6 (9.7)	31.7 (14.2)	22.8 (10.8)
Not U-loss	24	67.3 (29.0)	19.5 (9.7)	30.0 (12.9)	21.9 (9.2)
Current PTSD positive					
U-loss	20	77.6 (21.2)	15.5 (10.1)	35.5 (11.7)*	26.8 (6.3)
Not U-loss	21	73.0 (25.2)	21.4 (8.7)	27.9 (12.1)*	23.8 (7.5)

Note: *Significant difference between marked groups, $F(1, 39) = 4.2$, $p < .05$.

Discussion

This study is the first to utilize the AAI with a sample of combat veterans with PTSD. In addition to examining attachment classifications and U/d classification within this group, we also investigated the relationship between attachment organization, U-loss, and psychopathology.

Sample distribution across three main attachment organizations

Most surprising was that when our PTSD sample was classified across the three main categories of attachment organization, the distribution was not significantly different from the distribution that would be expected in a normal sample. The three-way distribution was also not like the distribution found in a sample of individuals with anxiety disorders (Fonagy et al., 1996), as had been expected. The Fonagy et al. anxiety disorders sample had much higher levels of insecure/pre-occupied attachment organization than our PTSD

sample. This was also surprising given that 52% of our sample had a comorbid diagnosis of an anxiety disorder other than PTSD.

In fact, the three-way distribution of our PTSD sample is unlike other psychiatric samples in the literature, including samples of individuals with depression (Cole-Detke & Kobak, 1996; Rosenstein & Horowitz, 1996; Tyrell & Dozier, 1997), bipolar disorder (Tyrrell & Dozier, 1997), eating disorders (Cole-Detke & Kobak, 1996; Fonagy et al., 1996), substance abuse (Fonagy et al., 1996), schizophrenia (Tyrell & Dozier, 1997), or personality disorders (Fonagy et al., 1996; Patrick et al., 1994; Rosenstein & Horowitz, 1996), all of which had much higher proportions of insecure attachment organization. Rather, as in normal samples (van IJzendoorn & Bakermans-Kranenburg, 1996), there was a high proportion of secure/autonomous transcripts in our sample. Many of the aforementioned clinical samples were drawn from inpatient psychiatric hospitals, and as such may have higher levels of psychiatric distress than our PTSD sample. However, our sample did report high rates of comorbidity and most reported PTSD symptoms in the severe to extremely severe range. The differences in the distribution across three-way attachment organization between our sample and other psychiatric samples may speak to differences between combat-related PTSD and other psychiatric diagnoses.

A most interesting and potentially relevant comparison is with the sample of women with childhood abuse histories, and particularly with the subset of the sample who met diagnostic criteria for PTSD (Stovall-McClough & Cloitre, 2006). The distribution across attachment classifications was presented in that study as a four-way distribution: secure/autonomous, insecure/dismissing, insecure/preoccupied, and unresolved/disorganized. We chose not to analyse our data in this four-way scheme, as the U/d classification represents a different phenomenon than the other patterns which have their origins in ordinary caregiving experience. However, a comparison of the distributions between the samples is quite interesting. Among the women with childhood abuse histories and current PTSD diagnosis, the distribution was 16.7% secure, 10% dismissing, 10% preoccupied, and 63.3% U/d. In our combat PTSD sample, the distribution was 33.3% secure, 10.4% dismissing, 6.3% preoccupied, and 50% U/d. Overall, these distributions are quite similar (a chi-square test was non-significant), although our combat PTSD sample evidenced a trend toward higher rates of secure attachment. This distinction may reflect differences in the impact of trauma experienced in childhood and that experienced in young adulthood. Importantly, combat trauma is not an attachment-related trauma as childhood trauma most often is.

U/d attachment in the sample and relationship to three main attachment organizations

Transcripts classified as U/d were much more frequent in the study sample than would be expected in a normal sample. However, the frequency of U/d classification was less than has been reported in a comparison sample of individuals with mixed anxiety disorders (Fonagy et al., 1996) but similar to the sample of women with PTSD secondary to childhood abuse (Stovall-McClough & Cloitre, 2006). Individuals with insecure/dismissing or insecure/pre-occupied attachment organizations were more likely to be classified as U-loss than were those with secure/autonomous organization. Secure attachment may provide some protection against unresolved attachment relative to loss.

U/d attachment and comorbid psychopathology

Our sample had high rates of Axis I comorbidity, but we did not find between group differences in terms of number of comorbid diagnoses as we expected. We did find that

individuals classified as U-loss were more likely to have an additional anxiety disorder, particularly panic disorder, a finding that replicates results reported by Stovall-McClough and Cloitre (2006) in their sample of women with childhood abuse histories. This was in spite of the fact that our U/d group primarily captured U-loss, while the U/d group in the Stovall-McClough and Cloitre study was U-trauma.

It is an important point to note that traumatic experiences and experiences of loss occurring in the combat zone were not queried in the AAI, and were not used in determining U/d status. It is possible that had these experiences been explored, higher rates of U/d attachment classification may have been found in our PTSD sample. Conversely, the U/d classification is fundamentally about attachment and combat trauma is not an attachment-related trauma. This distinction may be critical for understanding the relationship between attachment organization and PTSD. To further investigate this issue, future studies using the AAI with this population will need to address combat trauma and loss.

Attachment organization and PTSD

The fact that our sample was similar to normal samples in terms of three-way attachment classification indicates there is no association between this level of attachment classification and combat-related PTSD. This study is not longitudinal, and we cannot know how the veterans in our sample would be classified vis a vis attachment organization prior to their combat experiences. In general, attachment organization is assumed to be relatively stable across the lifespan, although the impact of combat trauma on attachment organization is unknown. Longitudinal data do support the relative stability of attachment organization over time (Hesse, 1999; Waters, Hamilton, & Weinfeld, 2000). The fact that the distribution across a three-way classification was like normal samples, and assuming that combat participants in Vietnam would be roughly normally distributed across attachment organizations, may provide some support for current three-way attachment organization as a good estimate of pre-military attachment organization. If we assume current attachment classification reflects pre-combat classification (granted, a large assumption at this point) because veterans classified as secure/autonomous still developed combat-related PTSD of comparable severity to those classified as insecure, secure attachment organization would not appear to provide significant protection against the development of PTSD in response to combat trauma. However, without a matched control group, and because the study was not longitudinal, the possible protective benefit of pre-combat secure/autonomous attachment organization relative to PTSD secondary to combat exposure was not directly tested.

U-loss and PTSD

We found support for an association between U-loss and psychopathology as evidenced by the overrepresentation of U-loss classification in our PTSD sample. In contrast to Turton, Hughes, Fonagy, and Fainman (2004), but similar to Stovall-McClough and Cloitre (2006), there was an association between U/d classification and PTSD caseness. When we modified our sample to retain only those veterans meeting criteria for a current PTSD diagnosis, we also duplicated the findings of Stovall-McClough and Cloitre relative to the significant association of U/d classification (U-loss in our study) with the avoidance/numbing symptoms of PTSD. We did not, however, find a significant association of U-loss classification and CAPS total severity scores. Our findings contribute to the growing body of evidence suggesting a link between U/d attachment and avoidance/numbing symptoms

in PTSD. The precise nature of this link is as of yet unclear, although Fearon (2004) suggests that U/d attachment results in poorly integrated representational formats following loss or trauma. When activated by associative cues, these unintegrated representations may result in a range of stress response syndromes.

Differences in findings among these three studies (Stovall-McClough & Cloitre, 2006; Turton et al., 2004; and the present study) examining attachment and PTSD may be tied to differences between the samples. Turton, Hughes, Fonagy, and Fainman's sample had recent loss (stillbirth) and recent PTSD. In fact, most participants' PTSD had remitted at one year. Stovall-McClough and Cloitre's sample had all experienced childhood abuse, and the unresolved/disorganized classification was made based on that abuse. Further, those in their sample who met criteria for PTSD were suffering many years of chronic PTSD secondary to childhood abuse. Our sample also had decades of chronic PTSD, although secondary to combat trauma. Our sample was classified U/d most frequently in relation to loss, but a high proportion also evidenced disorganized states of mind relative to childhood abuse. Combat trauma itself is an experience which combines loss with terror, horror, and vulnerability. As suggested by Fearon (2004), the psychological processes involved in responses to loss or trauma are unlikely to be simple, and may operate differently in different populations and circumstances.

Limitations

In considering the interpretation of the findings, several issues merit consideration. The use of self-report instruments is always subject to potential bias. As veterans involved in treatment, our sample was not naïve to PTSD and associated symptomatology. Much has been made of possible over-reporting among combat veterans with PTSD (Frueh, Gold, & de Arellano, 1997; Gold & Frueh, 1999). Of note, the vast majority of the current sample was already receiving service-connected disability for PTSD, most at high levels. Veterans receiving service-connected disability may be fearful of losing their compensation, and this can influence self-report of symptoms. This would most likely be evident on instruments directly measuring PTSD symptoms, such as the CAPS, although a wide range in scores on this instrument was found. Self-presentation concerns should not impact the AAI however, which is designed to assess non-conscious elements of internal experience by focusing more on linguistic patterns and overall discourse coherency rather than linguistic content, and so is considerably less face valid.

Comparison to other samples reported in the literature is problematic. The published normative data that was used for this comparison was based on six community samples of families that were believed to be "non-clinical." Individuals in those samples were not screened for the presence of psychiatric disorders, but it is unlikely that such disorders would be frequent enough to skew the distribution. Our PTSD sample was not well matched to the anxiety disorders sample in terms of gender, age, or ethnicity. The anxiety disorders sample used for comparison was predominantly female, with a mean age of 29 years, although there is no evidence that these variables impact attachment organization (Hesse, 1999). Unlike the comparison sample, our PTSD sample was not drawn from individuals currently psychiatrically hospitalized. The lack of a truly adequate control group for the present sample is of concern. The study sample would be best compared to a matched non-clinical sample of Vietnam combat veterans. Comparison to a matched psychiatric sample would be useful as well.

Our sample was restricted to Vietnam combat veterans who were involved in treatment for PTSD, and may not be generalizable to combat veterans with PTSD from other eras or

conflicts, or combat veterans who suffer from PTSD but who are not involved in treatment or who have not sought service-connected disability. Indeed, the nature of combat experience is in some ways very different from other "civilian" traumas, and Vietnam combat veterans are not representative of individuals with PTSD generally. The sample was self-selected, and perhaps individuals with secure/autonomous attachment organizations are more likely to be in treatment or to volunteer for participation in research. However, this same potential bias should influence AAI data from other clinical and non-clinical samples.

Despite its limitations, the data obtained in this study provide important preliminary information on attachment organization in Vietnam combat veterans diagnosed with PTSD. Our sample included many individuals with secure/autonomous attachment classifications, and yet high rates of U/d attachment, specifically U-loss. Further, those with insecure/dismissing or insecure/pre-occupied organizations were more likely to be also U-loss. If we assume relative stability of attachment organization across the lifetime, this suggests that while secure/autonomous attachment may provide some measure of protection against U-loss, it provides little protection against combat-related PTSD. Additional research in this area may further articulate the association between U/d attachment and PTSD. Our findings also augment current research on the potential relationship between U/d attachment and avoidance/numbing symptoms of PTSD in particular, by demonstrating this relationship in a sample of combat veterans with PTSD. Understanding this relationship may be critical for identifying at-risk individuals among combat soldiers. The application of attachment theory to problems of prevention and treatment of PTSD remains a promising area for research.

References

Bakermans-Kranenburg, M., & van IJzendoorn, M. (1993). A psychometric study of the Adult Attachment Interview: Reliability and discriminant validity. *Developmental Psychology*, *29*, 870–879.

Benoit, D., & Parker, K. (1994). Stability and transmission of attachment across three generations. *Child Development*, *65*, 1444–1456.

Blake, D.D., Weathers, F.W., Nagy, L.N., Kaloupek, D.G., Gusman, F., Charney, D.S., et al. (1995). The development of a Clinician-Administered PTSD Scale. *Journal of Traumatic Stress*, *8*, 75–80.

Blake, D.D., Weathers, F.W., Nagy, L.N., Kaloupek, D.G., Klauminser, G., Charney, D.S., et al. (1998 revision). *Clinician-Administered PTSD Scale for DSM-IV*. Boston: National Center for Posttraumatic Stress Disorder, Boston VA Medical Center.

Blanchard, E.G., Hickling, E.J., & Buckley, T.C. (1996). Psychophysiology of posttraumatic stress disorder related to motor vehicle accidents: Replication and extension. *Journal of Consulting and Clinical Psychology*, *64*, 742–751.

Blanchard, E.G., Jones-Alexander, J., & Buckley, T.C. (1996). Psychometric properties of the PTSD Checklist (PCL). *Behavior Research & Therapy*, *34*, 669–673.

Bowlby, J. (1982). *Attachment and loss*. *Vol. 1: Attachment* (2nd ed.). New York: Basic Books. (Original work published 1969).

Carlson, E.A. (1998). A prospective longitudinal study of attachment disorganization/disorientation. *Child Development*, *69*, 1107–1128.

Cole-Detke, H., & Kobak, R. (1996). Attachment processes in eating disorders and depression. *Journal of Consulting and Clinical Psychology*, *64*, 282–290.

Crowell, J., Waters, E., Treboux, D., Feider, O., O'Connor, E., Posada, G., et al. (1996). Discriminant validity of the Adult Attachment Interview. *Child Development*, *67*, 2584–2599.

Dozier, M., Stovall, K.C., & Albus, K.E. (1999). Attachment and psychopathology in adulthood. In J. Cassidy & P.R. Shaver (Eds.), *Handbook of attachment: Theory, research, and clinical implications* (pp. 497–519). New York: Guilford Press.

Fearon, P. (2004). Comments on Turton et al.: On the complexities of trauma, loss and the inter-generational transmission of disorganized relationships. *Attachment & Human Development*, *6*, 255–261.

Fearon, R.M.P., & Mansell, W. (2001). Cognitive perspectives on unresolved loss: Insights from the study of PTSD. *Bulletin of the Menninger Clinic*, *65*, 380–396.

First, M.B., Spitzer, R.L., Gibbon, M., & William, J.B.W. (2001). *Structured Clinical Interview for Axis I DSM-IV-TR disorders, research version, patient edition with psychotic screen*. New York: Biometrics Research Department, New York State Psychiatric Institute.

Fonagy, P., Leigh, T., Steele, M., Steele, H., Kennedy, R., Mattoon, G., et al. (1996). The relation of attachment status, psychiatric classification, and response to psychotherapy. *Journal of Consulting and Clinical Psychology*, *64*, 22–31.

Frueh, B.C., Gold, K.L., & deArellano, M.A. (1997). Symptom over-reporting in combat veterans evaluated for PTSD: Differentiation on the basis of compensation seeking status. *Journal of Personality Assessment*, *68*, 369–384.

George, C., Kaplan, N., & Main, M. (1985). Adult Attachment Interview. Unpublished manuscript, University of California, Berkeley.

Gold, P.B., & Frueh, B.C. (1999). Compensation-seeking and extreme exaggeration of psychopathology among combat veterans evaluated for posttraumatic stress disorder. *Journal of Nervous and Mental Disease*, *187*, 680–684.

Hesse, E. (1999). The Adult Attachment Interview: Historical and current perspectives. In J. Cassidy & P.R. Shaver (Eds.), *Handbook of attachment: Theory, research, and clinical implications* (pp. 395–433). New York: Guilford Press.

Hoge, C.W., Auchterlonie, J.L., & Milliken, C.S. (2006). Mental health problems, use of mental health services, and attrition from military service after returning from deployment to Iraq or Afghanistan. *Journal of the American Medical Association*, *295*, 1023–1032.

Hoge, C.W., Castro, C.A., Messer, S.C., McGurk, D., Cotting, D.I., & Koffman, M.D. (2004). Combat duty in Iraq and Afghanistan, mental health problems, and barriers to care. *New England Journal of Medicine*, *351*, 13–22.

Hovens, J.E., van der Ploeg, H.M., & Klaarenbeek, M.T.A. (1994). The assessment of posttraumatic stress disorder with the Clinician-Administered PTSD Scale: Dutch results. *Journal of Clinical Psychology*, *50*, 325–340.

Keane, T.M., Fairbank, J.A., Caddell, J.M., Zimmering, R.T., Taylor, K.L., & Mora, C.A. (1989). Clinical evaluation of a measure to assess combat exposure. *Psychological Assessment: A Journal of Consulting and Clinical Psychology*, *1*, 53–55.

Lyons-Ruth, K., & Block, D. (1996). The disturbed caregiving system: Relations among childhood trauma, maternal caregiving, and infant affect and attachment. *Infant Mental Health Journal*, *17*, 257–275.

Magruder, K.M., Frueh, B.C., Knapp, R.G., Johnson, M.R., Vaughan, J.A. III., Carson, T.C., et al. (2004). PTSD symptoms, demographic characteristics, and functional status among veterans treated in VA Primary Care clinics. *Journal of Traumatic Stress*, *17*, 293–301.

Main, M., & Goldwyn, R. (1991). *Adult attachment classification system*. Unpublished manuscript, University of California, Berkeley.

Main, M., Goldwyn, R., & Hesse, E. (2002). *Adult attachment scoring and classification system*. Unpublished manuscript, University of California, Berkeley.

Main, M., & Hesse, E. (1990). Adult lack of resolution of attachment-related trauma related to infant disorganized/disoriented behavior in the Ainsworth strange situation: Linking parental states of mind to infant behavior in a stressful situation. In M. Cumming (Ed.), *Attachment in the preschool years: Theory, research and intervention* (pp. 339–426). Chicago: University of Chicago Press.

Maunder, R.G., & Hunter, J.J. (2001). Attachment and psychosomatic medicine: Developmental contributions to stress and disease. *Psychosomatic Medicine*, *63*, 556–567.

Minde, K., & Benoit, D. (1991). Infant psychiatry: Its relevance for the general psychiatrist. *British Journal of Psychiatry*, *159*, 173–184.

Patrick, M., Hobson, R.P., Castle, P., Howard, R., & Maughan, B. (1994). Personality disorder and the mental representation of early social experience. *Development and Psychopathology*, *94*, 375–388.

Rosenstein, D.S., & Horowitz, H.A. (1996). Adolescent attachment and psychopathology. *Journal of Consulting and Clinical Psychology*, *64*, 244–253.

Sable, P. (1995). Attachment theory and post-traumatic stress disorder. *Journal of Analytic Social Work*, *2*, 89–109.

Sagi, A., van IJzendoorn, M., Scharf, M., Koren-Karie, N., Joels, T., & Mayseless, O. (1994). Stability and discriminant validity of the Adult Attachment Interview: A psychometric study in young Israeli adults. *Developmental Psychology*, *30*, 771–777.

Segal, D.L., Hersen, M., & Van Hasselt, V.B. (1994). Reliability of the Structured Clinical Interview for DSM-III-R: An evaluative review. *Comprehensive Psychiatry*, *35*, 316–327.

Steiner, J.I., Tebes, J.K., & Sledge, W.H. (1995). A comparison of the Structured Clinical Interview for DSM-III-R and clinical diagnoses. *Journal of Nervous and Mental Disease*, *183*, 365–369.

Stovall-McClough, K.C., & Cloitre, M. (2006). Unresolved attachment, PTSD, and dissociation in women with childhood abuse histories. *Journal of Consulting and Clinical Psychology*, *74*, 219–228.

Turton, P., Hughes, P., Fonagy, P., & Fainman, D. (2004). An investigation into the possible overlap between PTSD and unresolved responses following stillbirth: An absence of linkage with only unresolved status predicts infant disorganization. *Attachment & Human Development*, *6*, 241–253.

Tyrrell, C., & Dozier, M. (1997). *The role of attachment in therapeutic process and outcome for adults with serious psychiatric disorders*. Paper presented at the biennial meeting of the Society for Research in Child Development, Washington, DC.

van IJzendoorn, M.H., & Bakermans-Kranenburg, M.J. (1996). Attachment representations in mothers, fathers, adolescents, and clinical groups: A meta-analytic search for normative data. *Journal of Consulting and Clinical Psychology*, *64*, 8–21.

van IJzendoorn, M.H., Schuengel, C., & Bakermans-Kranenburg, M.J. (1999). Disorganized attachment in early childhood: Meta-analysis of precursors, concomitants, and sequelae. *Development and Psychopathology*, *11*, 225–249.

Warren, S.L., Huston, L., Egeland, B., & Sroufe, L.A. (1997). Child and adolescent anxiety disorders and early attachment. *Journal of the American Academy of Child and Adolescent Psychiatry*, *36*, 637–644.

Waters, E., Hamilton, C.E., & Weinfield, N.S. (2000). The stability of attachment security from infancy to adolescence and early adulthood: General introduction. *Child Development*, *71*, 678–683.