

Social Support Mediates the Relation between Attachment and Responses to Potentially  
Traumatic Events

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## **Dedication**

This dissertation is dedicated to my husband, John Eickholt.

## Abstract

Insecure adult attachment is consistently related to posttrauma functioning, but this relation has rarely been examined prospectively across a wide range of potentially traumatic events (PTEs). In addition, the mediating mechanisms for this relation are not yet fully understood. Therefore, the first aim of this study was to assess whether pre-trauma attachment orientation would predict changes in functioning following a PTE. The second aim was to determine whether social support would mediate this relation. Undergraduate students (N = 1,084) completed pre-PTE measures of psychological and social well being at Time 1 (T1); 73% (N = 789) completed a follow up survey 2 months later (Time 2; T2). Those who reported experiencing PTE between T1 and T2 completed a final follow-up survey 4 months after T1 (Time 3; T3). Insecure attachment orientation predicted increases in PTSD, psychological distress and aggression, and decreases in social functioning from T1 to T3. These relations were mediated by perceptions of social support reported at T2. These findings have important implications for research and practice with populations exposed to potentially traumatic events.

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Traumatic events are nearly universally experienced (Frazier, 2012) and the sequelae of exposure to these events is linked to a number of negative psychological outcomes, such as Posttraumatic Stress Disorder (PTSD; e.g., Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995), depression (e.g., Schumm, Briggs-Phillips & Hobfoll, 2006), somatization (e.g., Waldinger, Schultz, Barsky, & Ahern, 2006), and diminished relationship functioning (e.g., Anders, Shallcross, & Frazier, 2011). Although exposure to stressful and traumatic events is quite common, only a small percentage of individuals eventually develop significant posttraumatic adjustment difficulties or PTSD (Paris, 2000). This introduces the question of whether factors beyond trauma exposure, such as individual differences, shape appraisals of stressful events, responses to events, and capacity for resilience.

Many individual differences have been shown to relate to posttrauma adjustment. One such individual difference variable is adult attachment orientation (i.e., beliefs about the self and others in the context of close relationships). The attachment system is theorized to be activated in stressful situations (Bowlby, 1969, 1973, 1980), such as traumatic events. Attachment also influences perceptions and behaviors in interpersonal relationships, which are likely to be a critical factor in shaping trauma response and recovery (Charuvastra & Cloitre, 2008). Based in a rich theoretical and empirical literature, adult attachment provides a useful framework for examining social factors that shape trauma risk and recovery and has established relations with psychological well-being and social functioning (e.g., Mallinckrodt & Wei, 2005) generally, as well as posttrauma adjustment specifically (e.g., Mikulincer, Florian, & Weller, 1993). However,

most research relating attachment to posttrauma adjustment has involved retrospective reports and cross-sectional data collection. Therefore, the first aim of this study was to test whether differences in attachment orientations predict differential *changes* in psychological adjustment from pre-trauma to post-trauma. In addition, little research has assessed the mediating factors that explain the association between adult attachment and responses to traumatic events. Because social resources (e.g., perceived social support) are strongly associated with trauma recovery (e.g., Charuvastra & Cloitre, 2008) and with adult attachment orientations (e.g., Mallinckrodt & Wei, 2005), social resources are a potential mechanism explaining the connection between attachment orientations and posttrauma adjustment. Therefore, the second aim of this study was to test whether social support mediates the relation between adult attachment and pre-to-posttrauma changes in well-being.

In the following, I will first review the theoretical foundations of adult attachment orientations as well as findings demonstrating the clear association between specific attachment orientations and posttrauma adjustment. Next, I will describe evidence indicating that perceptions of social support may be an important mechanism through which attachment orientations are linked to posttrauma adjustment, including the relations between social support and posttrauma adjustment and between attachment and social support. Following this review, I will present the results of a prospective study assessing this mediation pattern.

### *Adult Attachment Orientation and Posttrauma Adjustment*

Attachment theory (Bowlby, 1969, 1973, 1980) proposes that early experiences with caregivers sculpt mental representations of the self and others (“working models”) that influence cognitions, affective responses, and behavior in later relationships. The attachment system is theorized to be activated during times of stress and to prompt proximity-seeking behaviors toward stronger/wiser attachment figures (i.e., caregivers with whom an infant has formed a strong emotional bond). When observing infants interacting with their caregivers in stressful situations, Ainsworth, Blehar, Waters, and Walls (1978) identified three distinct patterns of infant-caregiver behavioral interaction, which produced a typology of attachment that involved three typical attachment orientations: secure, insecure anxious/resistant, and insecure avoidant/resistant.

Attachment dynamics continue to evolve far beyond infancy. Bowlby (1969, 1973, 1980) theorized that working models of relationships (i.e., expectancies, attitudes, and beliefs) are continuously shaped by cumulative experiences of relating to significant others (including caregivers, romantic partners, and friends) throughout the lifespan. These working models operate as relational schemas (i.e., organizational structures based in relational experiences) that influence expectancies, attention, memory, and affective and behavioral responses, particularly in the context of stressful events (Baldwin, 1992; Collins & Read, 1994). They direct how people orient themselves to attachment figures and interpersonal information generally when stressors are encountered (Simpson & Rholes, 2012). Though they cannot be observed directly, many studies have documented the influence of working models on thoughts, feelings, and behavior, as well as

differential effects of secure versus insecure working models (i.e., different attachment orientations; see Mikulincer & Shaver, 2007, for a review).

Individual differences in attachment orientations in adults have primarily been measured in the context of romantic relationships via self-report (first with a categorical measure by Hazan and Shaver, 1987, and later with continuous measures that assess two primary, relatively uncorrelated dimensions of attachment insecurity, e.g., Brennan, Clark & Shaver, 1998; Fraley, Waller, & Brennan, 2000; Simpson, Rholes & Phillips, 1996). Over the past three decades, a wealth of empirical validation evidence has accumulated suggesting that these two dimensions, termed attachment anxiety and attachment avoidance, predict a wide array of interpersonal and relational factors, including mental health outcomes.

The two insecure attachment orientations, which result from perceptions or memories of experiences of either rejection or neglect in prior relationships, have been repeatedly linked to poorer relationship functioning and less favorable responses to psychological stress (see Mikulincer & Shaver, 2007). The first of these orientations, *anxious attachment*, is associated with a strong desire for intimacy, coupled with the anticipation of disappointing responses from relationship partners. Anxious individuals also use “hyperactivating” strategies to cope with distress (Mikulincer, Shaver, & Horesh, 2006). For example, individuals with a more anxious attachment orientation report heightened emotional distress when they are exposed to stressful situations (Feeney & Kilpatrick, 1996), and they maintain higher levels of distress for longer periods of time after stressors are no longer present (Rholes, Simpson, & Orina, 1999). They also

struggle to maintain a sense of felt security in their relationships, and they experience greater negative affect in response to ruminative worrying about their relationships, all of which disrupt their ability to engage in more instrumental and effective coping with stressors (Mikulincer, 1998).

Individuals who have a more *avoidant attachment orientation*, on the other hand, avoid closeness and are rigidly self-reliant, desiring control and autonomy in their close relationships (Mikulincer, 1998; Mikulincer & Shaver, 2003). When stressed, they engage in “deactivating” strategies (Mikulincer et al., 2006) that involve suppressing negative thoughts, negative affect, and impulses to seek support from their attachment figures. This results in lower self-reported reactivity to stressors by more avoidant individuals (Lopez & Brennan, 2000). However, more avoidant individuals also display greater physiological arousal in stressful circumstances (Feeney & Kirkpatrick, 1996).

Adults who report lower levels of both anxiety and avoidance tend to have a *secure attachment orientation*, viewing themselves as worthy of caring responses from others and perceiving others as sensitive and responsive to their needs. These beliefs and attitudes allow secure individuals to engage in more effective problem solving in stressful situations (e.g., Mikulincer, et al., 1993) and to maintain more stable, well-functioning relationships (Feeney, 2008; Simpson, 1990).

Research also indicates that attachment orientations are associated with differential adjustment following trauma exposure (see Mikulincer, et al., 2006, for a review). Attachment security was associated with reduced likelihood of PTSD, depression, anxiety, and somatization (Zakin, Solomon, & Neria, 2003) and with greater

posttraumatic growth (Salo, Qouta, & Punamaki, 2005). Attachment insecurity (averaging across the two types of insecure attachment orientations) was associated with higher reported levels of PTSD symptoms following war captivity (Dieperink, Leskela, Thuras, & Engdahl, 2001; Solomon, Ginzburg, Mikulincer, Neria, & Ohry, 1998). In studies that have examined attachment anxiety and avoidance separately, anxiety was associated with more distress and greater likelihood of experiencing PTSD (Declercq & Willemsen, 2006), and avoidance was associated with greater risk of PTSD and less favorable assumptions about the benevolence of the world (O'Connor & Elklit, 2008). A “fearful” attachment orientation (which contains elements of both anxious and avoidant attachment characteristics) was associated with greater dissociation in survivors of childhood sexual abuse (Anderson & Alexander, 1996).

Some differences in the quality of coping and trauma responses have been found between individuals who were classified as anxiously versus avoidantly attached (based on a categorical measure derived from the Hazan and Shaver (1987) measure, see Mikulincer, Florian, & Tolmatz, 1990 for a description). More specifically, following the Iraqi Scud missile attacks during the 1991 Gulf War, anxiously-attached individuals reported using more maladaptive emotion-focused coping, reported higher levels of depression and anxiety, and experienced more severe intrusion and avoidance symptoms, whereas avoidantly-attached individuals used distancing coping strategies, denied or suppressed anxiety and depression symptoms, and reported increased somatization (Mikulincer, et al., 1993).

One limitation across all of these studies is that they most often involved cross-sectional data, collected after the occurrence of a traumatic event. Though a handful of studies have assessed the relation between attachment and posttrauma functioning longitudinally (e.g., Solomon, Shklar, & Mikulincer, 2005), for all but two of these studies (see below), all data were collected post-trauma. Thus, although links between attachment and posttrauma functioning have been established, the most common methodologies used to test this relation preclude any sort of causal conclusions and may confound the effects of the trauma and the assessment of attachment orientations.

Two studies have examined the effects of attachment on posttrauma adjustment prospectively (using measures of attachment gathered pre-trauma). Using the Strange Situation Procedure (Ainsworth, et al., 1978), one study assessed the relation between attachment orientations assessed at 12 months of age and mental health outcomes (PTSD, generalized anxiety disorder, specific phobias, and separation anxiety) following exposure to violence victimization and witnessing violence in the home, school, and neighborhood at 8.5 years (MacDonald et al., 2008). Disorganized attachment (an attachment classification unique to the Strange Situation Procedure that involves behavioral disorganization based on the simultaneous activation of incompatible approach-avoidance motivations in the presence of a caregiver) was associated with greater PTSD symptoms at 8.5 years, but not with any other anxiety disorder symptoms. It is not clear whether this relation would generalize to an adult population or to measures of adult romantic attachment orientations (i.e., anxiety or avoidance). Given that attachment orientations can change over long time periods, a more proximal pre-trauma

measure of attachment, such as attachment to romantic partners in adulthood, could be more informative. In another prospective study, Mikulincer, Horesh, Berant, and Gillath (2004) studied Israelis' psychological reactions during the 2003 U.S.-Iraq war (as cited in Mikulincer, Shaver, & Horesh, 2006, p. 87-89). They assessed attachment anxiety and avoidance before the war and then gathered diary data of trauma-related symptoms after the war for 21 days. Attachment anxiety predicted daily intrusion and hypervigilance symptoms, whereas attachment avoidance predicted daily avoidance and hypervigilance symptoms.

Taken together, these cross-sectional and prospective studies provide evidence for the link between adult romantic attachment orientations and posttrauma adjustment. Of note, only one unpublished prospective study has been conducted with a measure of adult attachment collected pre-trauma. In addition, the mechanisms through which individual differences in attachment are associated with posttrauma adjustment are not fully understood. Further understanding of mediating mechanisms for these relations is essential to developing etiological models of PTSD and effective interventions for individuals who have more insecure attachment styles. One potential mechanism is perceived social support, given its robust relations both to posttrauma adjustment (Ozer, Best, Lipset, & Weiss, 2003) and to attachment orientations (e.g., Simpson, Rholes, & Nelligan, 1992; Simpson, Rholes, Campbell, Tran, & Wilson, 2003), as described below.

*Social Support as a Potential Mediator of the Relation between Attachment Orientations and Posttrauma Adjustment*

Perceptions of the quality of available social support are closely linked to posttraumatic adjustment. For example, meta-analyses (Brewin, Andrews, & Valentine, 2000; Ozer et al., 2003) indicate that the perceived availability of social support is a robust predictor of PTSD following a traumatic event. Positive social network interactions can help resolve PTSD or act as a protective factor with regard to its development, whereas negative interactions can serve as a risk factor. For example, in a 14-year prospective study of Vietnam War veterans, veterans who had more community involvement had better psychological outcomes than did those who perceived negative community attitudes (Koenen, Stellman, Stellman, & Sommer, 2003).

Attachment is also associated with the use of relational and social resources. In times of stress, securely attached people engage in more support-seeking behavior, perceive greater support, and use more effective coping strategies (e.g., Collins & Feeney, 2000; Mikulincer et al., 1993; Simpson, et al., 1992). In contrast, more insecurely attached people have negatively biased perceptions of interpersonal situations. They either heighten (in the case of attachment anxiety) or suppress (in the case of attachment avoidance) negative affect in response to stressful events, and engage in less effective behavioral strategies when trying to regulate their negative emotions (see Lopez & Brennan, 2000, for a review). Following exposure to trauma, O'Connor and Elflit (2008) found that anxiously attached individuals reported lower perceived social support and avoidant individuals reported lower beliefs in the benevolence of others. Those who were more insecurely attached were also particularly sensitive to an initial perceived lack of support (within an experimental context) and maintained increases in physiological

arousal after support had been offered by romantic partners (Feeney & Kirkpatrick, 1996). Decreased social self-efficacy and emotional awareness are among the mechanisms that mediate the relations between insecure attachment orientations and lower perceived social support (Mallinckrodt & Wei, 2005). Thus, individuals who have more insecure attachment orientations would be less inclined to engage in patterns of emotion-regulation, communication, and social engagement that foster positive social support interactions. Therefore, perceptions of social support are likely to mediate the connection between adult attachment orientations and posttrauma adjustment.

One recent study investigated the mediating role of social support in a sample of Israeli students who were evacuated from a college campus in response to missile attacks (Besser & Neria, 2012). All data were collected at one time point, during the evacuation. In this sample, attachment anxiety, but not attachment avoidance, was found to relate to lower perceptions of social support and higher reported PTSD symptoms. The relation between anxious attachment and PTSD symptoms was mediated by lower perceived social support.

### *Summary and Critique*

In sum, across studies with different populations and different types of traumatic events, the relation between one or both dimensions of attachment insecurity has been well established. However, this previous research has several limitations. First, the overwhelming majority of studies of adult romantic attachment and posttrauma adjustment have used cross-sectional measures of key constructs. Previous studies of mediating mechanisms (Benoit, Bouthillier, Moss, Rouseau, & Brunet, 2009; Browne &

Winkelman, 2007), including social support (Besser & Neria, 2012), have involved data collected at only one time point, and have not included pre-trauma measures of attachment orientation. In mediation analyses, the measurement of variables at three separate time points increases the validity of mediation models because it provides greater evidence for establishing the mediator as a link in a causal chain (Kraemer, Stice, Kazdin, Offord, & Kupfer, 2001). This approach is deemed by some to be essential to testing such models (Kraemer et al., 2001). Second, previous research has focused primarily on PTSD and related psychopathology (though there have been some exceptions, such as a study of attachment and posttraumatic growth by Salo et al., 2005). Given that traumatic events are likely to impact well being across a variety of domains, perhaps particularly for college students as they navigate a critical period of development, it is important to examine outcomes beyond PTSD. Better understanding of the full breadth of posttrauma outcomes in general, and in relation to adult attachment more specifically, could assist in developing and tailoring interventions to more fully meet the needs of individuals with insecure attachment orientations. Finally, most previous studies have examined responses to one specific event or a small cluster of similar events (e.g., sexual assault, harassment). However, attachment orientations should predict responses to many different types of stressors, beyond those already examined in the literature. Thus, a more thorough examination of an array of potentially traumatic events would augment the current empirical evidence for the importance of attachment orientation in the context of posttrauma adjustment.

### *The Current Study*

The current study improved upon previous research in several ways. First, using a prospective longitudinal design, attachment orientations were measured prior to the occurrence of potentially traumatic events (PTEs) and mediation models were tested using data collected at three different time points. Because the data were collected from participants at three time points, relations between key predictor variables and *changes in* well-being following exposure to PTEs could be examined more rigorously, allowing for stronger tests of causal hypotheses regarding the effects of romantic attachment orientations on post-PTE outcomes. This methodological improvement also permitted proper tests of whether diminished social support following a PTE explained the connection between insecure attachment orientations and poorer post-PTE adjustment. If attachment predicts less favorable posttrauma adjustment, and this relation is mediated by social support, this information could guide the development of even more effective interventions for trauma survivors by, for example, assisting those with insecure attachment orientations to develop social skills and increase their social support.

Second, this study included additional outcome measures to determine whether romantic attachment orientations predicted changes in outcomes beyond psychological well-being. Because associations between avoidant attachment and hostility have been found in previous research (e.g., Mikulincer et al., 1993), changes in self-reported aggression were included as an additional outcome measure. Also, because general social functioning is closely tied to psychological well-being, and may be an area of particular vulnerability for more insecurely attached people, this well-being domain was also evaluated as an outcome measure.

Third, a very wide range of stressors were assessed, including those that did not meet the current DSM-IV Criterion A1 definition for traumatic events and have not often been included in previous trauma studies (e.g., peer rejection). These non-Criterion A events can be just as detrimental as Criterion A events with respect to both mental health and relational well-being (Anders, Frazier, & Frankfurt, 2010; Anders, Shallcross, & Frazier, 2011). Assessment of a broad array of PTEs allows for a more comprehensive assessment of relations between romantic attachment orientations and well-being following exposure to different PTEs.

In this study, baseline (Time 1) data were collected from a large sample of undergraduates ( $N = 1,084$ ) regarding attachment orientation, and psychological and social well being, including PTSD symptoms, general psychological distress, aggression, and social functioning. Eight weeks later (at Time 2), participants reported whether they had been exposed to a wide range of potentially traumatic events (PTE) since Time 1 and completed measures of perceived social support. Sixteen weeks after the initial assessment, participants reported on their current psychological and social well-being again.

### *Hypotheses*

**Hypothesis 1:** I predict that more insecure attachment orientations assessed pre-PTE (T1) will predict larger increases over time in psychological distress (i.e., PTSD symptoms, psychological distress) and aggression, and larger decreases over time in social well being (i.e., social connectedness, loneliness) from pre-PTE to post-PTE (i.e., from Time 1 to Time 3) in comparison to lower insecurity (i.e., attachment security).

**Hypothesis 2:** I predict that the relation between more insecure attachment orientations at Time 1 and decrements in the indicators of well-being from Time 1 to Time 3 will be mediated by lower perceived social support (i.e., positive and negative social support and social withdrawal) following the interim trauma (at Time 2).

## **Method**

### **Participants and Procedures**

At baseline, data were collected from 1,084 undergraduates at a large public university ( $n = 842$ ) and a community college ( $n = 242$ ) (Time 1, T1), both located in the same large Midwestern metropolitan area. Data were collected from these two institutions to recruit a more diverse sample, to be able to broaden the generalizability of these findings, and because, to my knowledge, no previous studies have examined potentially traumatic events in community college students, despite the large number of students enrolled at these institutions (American Association of Community Colleges, 2011) and evidence that these students may differ from students at four year colleges and universities in numerous ways (e.g., being less likely to persist to the second year, being older; McIntosh & Rouse, 2009). Participants completed online surveys for extra credit in a wide variety of psychology courses and were recruited via their instructors, through online and paper advertisements, and classroom announcements by research assistants.

Two months later, all T1 participants were asked via email to complete the Time 2 (T2) survey. Surveys were completed by 789 students (a 73% response rate). Of those who completed the T2 survey, 556 reported experiencing a potentially traumatic event between T1 and T2. Email invitations to complete the Time 3 (T3) survey were sent to

305 students to get an estimated sample size of 200, which is considered a minimum for structural equation modeling (SEM; Worthington & Whittaker, 2006). I anticipated a slightly lower response rate at T3 (~66%) than at T2 (73%) because students were no longer enrolled in the classes in which they were receiving extra credit. Instead, T3 participants received \$10 Amazon.com gift certificates as compensation for completing the survey. Of the 305 recruited, 184 completed the T3 survey (60%), close to our estimated response rate.

At T1, most participants were between 18 and 21 years old (74%), with fewer participants in the 22-30 (20%), 31-40 (4%) and over 40 (2%) categories. Most participants were female (75%). Most participants identified as European American/White (75%), with fewer endorsing racial/ethnic backgrounds in the Asian American/Asian (14%), African American (4%), Multiracial (3%), Hispanic/Latino/Mexican American (2%), other (2%), Middle Eastern (<1%) or Native American (<1%) categories. The students were primarily (94%) undergraduates (32% 1st year, 26% 2nd year, 20% 3rd year, 16% 4th year). Sample characteristics were similar for the full sample at T2 (76% between 18 and 21 years old, 75% female, 80% European American/White, 94% undergraduate) and for the 184 participants at T3 who comprise the sample for these analyses (79% between 18 and 21, 86% female, and 81% European American/White, 93% undergraduate).

## **Measures**

The data reported here are part of a larger study (see Anders, Frazier, & Shallcross, 2012). Below I describe the measures used to test the proposed mediational

model: adult attachment at T1, exposure to potentially traumatic events between T1 and T2 assessed at T2, social support assessed post-PTE at T2, and outcome measures assessed at T1 and T3 to assess change from pre- to post-PTE (with the exception of PTSD symptoms as described below).

**Demographics.** Participants were asked to report their age, gender, and race.

**Adult Attachment.** Adult attachment orientations were measured at T1 using the Adult Attachment Questionnaire (AAQ; Simpson, et al., 1996), a 17-item measure that assesses attachment anxiety (9 items; e.g., “I usually want more closeness and intimacy than others do”) and avoidance (8 items; e.g., “Others often want me to be more intimate than I feel comfortable being”). The scale anchors for the AAQ are 1 = *strongly disagree* and 7 = *strongly agree*. Scale scores have displayed good reliability, as well as convergent and predictive validity in college student samples (Simpson et al., 1992; Simpson et al., 1996). Reliabilities for scores in this sample were .84 and .81 for the anxiety and avoidance subscales, respectively.

**Potentially traumatic events.** The Traumatic Life Events Questionnaire (TLEQ; Kubany, 2004) contains a list of 22 stressful events (e.g., life threatening illness, sexual assault) and a question regarding the experience of any "other" events that were disturbing or distressing to the respondent. Evidence for the test-retest reliability as well as convergent validity (in comparison to interview responses) has been observed for TLEQ scores (Kubany, 2004). Because previous research (Anders et al., 2011) has found that exposure to common relational events (e.g., relationship dissolution) is associated with levels of PTSD symptoms similar to those reported following exposure to Criterion

A1 events, 25 additional events (e.g., ostracism) were added to the checklist (see Anders et al., 2012, for a complete list of events assessed and the rationale for the selection of events). Six event categories representing childhood events were eliminated; thus, at T2, participants indicated whether they had experienced each of 42 events or the one “other” unspecified event since completing the T1 survey.

**Social Support.** Measures of both positive and negative social support were assessed using abbreviated versions of standard scales. For unhelpful support, I used an abbreviated version of the 24-item Unsupportive Social Interactions Inventory (USII; Ingram, Betz, Mindes, Schmitt, & Grant, 2001). This 8-item scale contained two items from each of the four USII factors: Distancing, Bumbling, Minimizing, and Blaming. Participants rated how often they encountered different types of unsupportive reactions from potential support providers with regard to their PTE (scale anchors were 1 = *None of the time* and 4 = *A lot of the time*). Scores on the full version of the USII have shown very good internal consistency ( $\alpha = .90$ ), and good evidence for construct validity in college student samples (Ingram et al., 2001). Scores on the abbreviated version of this scale have also demonstrated good psychometric properties in previous research with college students (Frazier, Gavian, et al., 2011). Reliabilities in this sample were also good ( $\alpha = .87$  at T2). Positive social support was measured using 8 items from the 19-item MOS Social Support Survey (Sherbourne & Stewart, 1991). Two items were used from each of the four subscales, which measure perceptions of tangible, affectionate, positive social interaction, and emotional/informational support. Scale anchors were 1 = *None of the time* and 5 = *All of the time*. This is a general, rather than event-specific, measure of

perceived support. Scores on the 19-item version of this scale have very good internal consistency ( $\alpha = .97$ ) as well as convergent and discriminant validity (Sherbourne & Stewart, 1991). Reliabilities in this sample were very good ( $\alpha = .93$  at T2).

**Social Withdrawal.** The extent to which respondents engaged in social withdrawal was measured by the 9-item Social Withdrawal subscale of the Coping Strategies Inventory (CSI; Tobin, Holroyd, Reynolds, & Wigal, 1989). Participants rated how much they used social withdrawal in the past week to deal with their interim PTE on a 1 (*not at all*) to 5 (*very much*) scale. Scores on this subscale have demonstrated reliability and validity in undergraduate samples (Tobin, et al., 1989). The alpha coefficient in this sample was .93 at T2.

**PTSD symptoms.** The PTSD Checklist – Specific Version (PCL-S; Weathers, Litz, Herman, Huska, & Keane, 1993) is a 17-item self-report measure consisting of items that assess the symptom criteria for a PTSD diagnosis according to the *DSM-IV-TR* (APA, 2000). Participants responded to items in terms of their interim events. Items were rated on a 1 (*not at all*) to 5 (*extremely*) scale with regard to the previous 2 weeks. A recent study found strong support for the test-retest reliability, internal consistency reliability, and convergent validity of scores on the PCL (Adkins, Weathers, McDevitt-Murphy, & Daniels, 2008). Because the interim trauma had not yet occurred at Time 1 PTSD scores were not available at T1. Because I was interested in assessing change in distress from T1 to T3, T3 PTSD scores were used in these analyses. The alpha coefficient for scores on the total PTSD symptom severity scale was .95 in the sample at T3. The avoidance (7 items), hyperarousal (5 items), and reexperiencing (5 items)

subscale scores on this measure were used as indicator variables for a latent variable for PTSD. Reliabilities for these subscales also were good in this sample (for avoidance  $\alpha = .88$ ; for hyperarousal  $\alpha = .88$ ; and for reexperiencing  $\alpha = .88$ ).

**General Distress.** General psychological distress was assessed using 17 items that compose the depression (6 items), anxiety (6 items), and hostility (5 items) subscales of the Brief Symptom Inventory (BSI; Derogatis, 1993). Scale anchors were 1 = *Not at all* and 5 = *Extremely*. Scores on this measure have been shown to be reliable in college samples (Frazier et al., 2011;  $\alpha = .92$ ), and they demonstrated good internal consistency reliability in this sample (full scale  $\alpha = .92$  and  $.94$  for time T1 and T3, respectively). Subscale scores were used as indicator variables to define a latent variable for general psychological distress. Reliabilities in this sample were also good for the subscales (for depression  $\alpha = .87$  and  $.89$  for time T1 and T3, respectively; for anxiety  $\alpha = .84$  and  $.87$  for time T1 and T3, respectively; and for hostility  $\alpha = .75$  and  $.83$  for time T1 and T3, respectively).

**Aggression.** The Subtypes of Antisocial Behavior Questionnaire (STAB; Burt & Donnellan, 2009) is a 32-item measure that assesses three types of antisocial behaviors, including physical aggression, rule-breaking, and social aggression. We administered rule-breaking (11 items; e.g., “Was suspended, expelled, or fired from school or work”) and social aggression (11 items; “Tried to hurt someone’s feelings”) scales. Scale anchors were 1 = *Never* and 5 = *Nearly all the time*. The alpha coefficients for scores on these two scales were  $.85$  (social aggression) and  $.78$  (rule-breaking) in a college student sample. Evidence for criterion-related validity of scores included expected correlations with

measures of similar constructs and higher scores among adjudicated versus community samples. Alpha coefficients in this sample for a combination of these two subscales were .85 at both T1 and T3.

**Social connection.** Perceptions of social connectedness (an indicator of social well-being) were measured using the Social Connectedness Scale-Revised (Lee, Draper, & Lee, 2001). This 20-item measure has 10 positively worded and 10 negatively worded items (e.g., “I’m able to connect with other people”, “I feel distant from people”) rated on 6-point scale ranging from 1 = *Strongly Disagree* and 6 = *Strongly Agree*. Scores on this scale have good reliability in college samples. Reliabilities in this sample were also very good ( $\alpha = .94$  and  $.94$  for time T1 and T3, respectively).

**Loneliness.** Loneliness (another indicator of social well-being) was measured using a 10-item version of the UCLA Loneliness Scale (Russell, Peplau, & Cutrona, 1980). Scale anchors were 1 = *I never feel this way*, and 4 = *I often feel this way*. Scores on this scale, in full and abbreviated forms, have accrued extensive reliability and validity evidence, including in college samples (Russell, 1996). Reliabilities in this sample were also very good ( $\alpha = .93$  and  $.95$  for time T1 and T3, respectively).

## Results

### Preliminary Analyses

First, I assessed whether individuals who completed the T2 survey ( $n = 789$ ) differed from those who did not ( $n = 295$ ) on the T1 variables in the model (i.e., anxious and avoidant attachment dimensions) and in terms of demographic characteristics. These analyses suggested that those who completed the T2 survey scored lower on anxious (but

not avoidant) attachment,  $t(1059) = 2.91, p < .05, d = .20$ . Chi-square tests comparing the demographic characteristics of those who did and did not complete the T2 survey indicated no significant differences in gender or year in school; however, there were significant racial/ethnic,  $\chi^2(7) = 37.64, p < .001$ , and age,  $\chi^2(4) = 8.78, p = .03$ , differences. Specifically, White students were more likely to complete T2 (77%) than students from other racial groups (e.g., African American - 62%; Asian/Asian-American - 60%), and students over 40 were more likely to complete T2 (90%) than younger students (i.e., 18-21 year olds - 75%; 22-30 and 31-40 year olds - 67%). In addition, the community college students ( $n = 151, 62\%$  response rate) were significantly less likely to complete the T2 survey than were the university students ( $n = 638, 76\%$  response rate;  $\chi^2(1) = 16.98, p < .001$ ). Second, I assessed whether individuals who completed the T3 survey ( $n = 184$ ) were similar to those who were recruited for T3, but did not complete the survey ( $n = 121$ ). There were no significant differences between those who completed the T3 survey and those who did not on T1 attachment, T2 social resources, or any of the demographic characteristics (i.e., gender, race, age, year in school, or school), all  $ps > .05$ .

Within the larger sample, I also compared those who did and did not experience traumatic events on level of attachment anxiety and avoidance. These analyses suggested that those who reported experiencing an interim event in the T2 survey scored higher on both anxious,  $t(775) = 3.98, p < .05, d = .29$ , and avoidant attachment,  $t(778) = 2.06, p < .05, d = .15$ . In addition, lifetime exposure to potentially traumatic events was correlated with attachment for both Criterion A ( $r_s = .17$  and  $.18, ps < .05$ ,\_for attachment anxiety

and avoidance, respectively) and non-Criterion A ( $r_s = .27$  and  $.25$ ,  $p_s < .05$ , for attachment anxiety and avoidance, respectively) events. I also assessed for an association between distress at the time the event occurred and attachment. Attachment anxiety ( $r = .10$ ,  $p < .05$ ), but not attachment avoidance, was associated with distress at the time the interim event occurred.

To prepare the data for analysis, they were checked for errors and random response patterns. Histograms were created for each item to assess whether variables were distributed as expected (i.e., normal distribution in most cases). Outliers on all scales were identified via visual inspection of histograms and Grubb's test. Nine outlying values (across all scales and time points) greater than three standard deviations from the mean on each scale were winsorized by assigning the next highest (or lowest) scores in the sample. Associations between attachment orientation scores, the mediator variables, and the T3 and T1-T3 residual scores on the outcome measures were initially assessed with bivariate correlations (see Table 1).

### **Missing Data**

To test the hypotheses, the subsample of individuals who had experienced an interim event between T1 and T2 and who completed the Time 3 survey ( $n = 182$ ) was selected for the primary analyses that are reported below. This involved the listwise deletion of data from individuals who had experienced an interim event, but who did *not* complete Time 3. Although other methods have been recommended for dealing with missing data (e.g., full information maximum likelihood (FIML) estimation; Schlomer, Bauman, & Card, 2010), listwise deletion was chosen because of the large proportion of

(> 30%) of missing cases at Time 3. Listwise deletion was deemed preferable because FIML overestimates standard errors when the proportion of missing data is very large (Schlomer et al., 2010).

### **Assessing Changes in Outcome Variables**

To assess changes in the measures of psychological distress, aggression, and social functioning from pre to post-PTE, change variables were created by partialing pretrauma ratings of outcome measures from posttrauma measures (at Time 3) and creating residual scores. Because the PCL-S is an event-specific scale and could not be assessed pretrauma, PCL-S scores at Time 3 were used to assess PTSD symptoms.

### **Measurement Model**

The factor loadings from the indicators to the latent variables are shown in Table 2. The indicators for the attachment anxiety and attachment avoidance latent factors were item parcels, derived from item-total correlations for each attachment subscale (i.e., anxiety and avoidance) with the relative magnitude of the correlations distributed as equally as possible across parcels. The indicator variables for the social support factor included the abbreviated versions of the MOS Social Support Survey and the USII, and the Social Withdrawal subscale of the CSI completed at T2. For the PTSD latent factor, the avoidance, hyperarousal, and reexperiencing subscale scores at T3 were used as indicator variables. The indicator variables for general psychological distress were T1-T3 residual scores on the depression, anxiety, and hostility subscales of the BSI. Indicator variables for aggression included the T1-T3 residual scores for the two subscales of the STAB. Finally, indicator variables for the social functioning outcome were the T1-T3

residual scores on the UCLA Loneliness and the Social Connectedness Scales. Parceling data leads to several advantages over item-level data (e.g., more parsimonious models, fewer chances for correlated residuals or dual loadings, reductions in sampling error; MacCallum, Widaman, Zhang, & Hong, 1999). In addition, parceling, through principles of aggregation, has several advantages in terms of psychometric considerations (see Little, Cunningham, Shahar, & Widaman, 2002, for a review). Parceling is also consistent with the research questions of this study, in that the primary purpose of this investigation is to determining structural relations among constructs (Little, et al., 2002).

The fit statistics for the measurement model including attachment, mediator, and outcome variables (with all latent variables allowed to correlate) are shown in Table 3. Although the chi-square statistic was significant, the comparative fit index (CFI = .96), the root-mean-square error of approximation (RMSEA = .05), and standardized root mean square residual (SRMR = .05) were at recommended levels (.95, <.06, and <.08, respectively, Hu & Bentler, 1999).

### **Structural Models**

To test the first hypothesis regarding the relations between pre-PTE attachment and posttrauma outcomes, models were run that included only direct paths between the two adult attachment orientations (anxiety and avoidance) and the outcome variables - general psychological distress (BSI), PTSD symptoms (PCL-S), General Social Functioning (UCLA Loneliness Scale, Social Connectedness Scale), and Aggression (STAB) - in four separate models. The anxiety and avoidance latent variables were allowed to correlate ( $\beta = .30, p < .01$ ) in all models. Both pre-PTE attachment anxiety ( $\beta =$

.23,  $p < .01$ ) and avoidance ( $\beta = .19$ ,  $p < .05$ ) were significantly associated with PTSD symptoms assessed at T3 (at least 2 months following the interim PTE). Pre-PTE attachment anxiety was also associated with changes in distress from T1 to T3 ( $\beta = .35$ ,  $p < .01$ ), and had a marginally significant relation with changes in aggression from T1 to T3 ( $\beta = .20$ ,  $p < .10$ ). Attachment avoidance ( $\beta = -.17$ ,  $p < .05$ ), but not attachment anxiety ( $\beta = .06$ ), predicted changes in social well-being from pre- to post-PTE. The models showed good fit to the data across outcomes: PTSD ( $\chi^2 = 34.67$ ,  $p = .07$ , RMSEA = .05, CFI = .99, SRMR = .04), psychological distress ( $\chi^2 = 20.50$ ,  $p = .67$ , RMSEA = .00, CFI = 1.00, SRMR = .03), aggression ( $\chi^2 = 20.62$ ,  $p = .24$ , RMSEA = .03, CFI = .99, SRMR = .03), and social functioning ( $\chi^2 = 20.24$ ,  $p = .26$ , RMSEA = .03, CFI = .99, SRMR = .03) Thus, individuals who had less secure (i.e., more insecure) attachment orientations exhibited larger increases in distress from pre- to post-PTE, consistent with the first hypothesis. Attachment orientations explained between 4% and 11% percent of the variance in the four outcome latent variables.

Nested models were then run that included the mediating variables measured at Time 2 (immediately post-PTE), both with and without direct paths from the attachment latent variables (assessed at T1) to the outcome variables. Four full mediation models were tested, one for each of the four outcomes. For each outcome, a structural model was tested to determine whether perceptions of social support fully mediated the link between the two adult attachment orientations and the outcome variable (i.e., no direct paths from attachment to the outcome variables). Adequate fit statistics were found for all four outcomes (see Table 3). These models were then compared to models that included direct

paths from the two attachment orientations to outcomes (see Table 3 for the fit statistics for these models). Comparisons were then made between the models with and without the direct paths from the T1 attachment orientations to the outcome latent variables. The chi-square difference test was used to determine whether fit depreciated enough with the full mediation model (without direct paths) in order to reject the more parsimonious model.

Based on these comparisons, only one full mediation model was rejected due to poorer overall fit (the model predicting changes in general psychological distress). Some researchers have argued that the use of the chi-square difference statistic to assess changes in model fit is undesirable because it is too sensitive to slight variations in fit (see Cheung & Rensvold, 2002). These authors recommended the use of the CFI as an indicator of model fit. Thus, comparisons were also made using change in CFI (a change in CFI of greater than .01 is recommended as a criterion for judging whether models are non-equivalent in terms of fit). Based on these comparisons, no full mediation models (i.e., no models without direct paths from attachment to outcomes) were rejected, indicating support for the mediating effect of social support across various outcome measures. Because the models that contained direct paths from the two attachment orientations to the residual outcome variables did *not* demonstrate better fit than those without direct paths, and because the models without direct paths were more parsimonious, the coefficients for the models without direct paths are reported in Table 4. Across the various outcomes, both types of models had good fit. For these final models, the recommended minimum of 5 to 10 cases per parameter estimated suggested that 140

to 280 cases were needed to test the models, and the sample size of 182 fell within that range (Kline, 2005).

In the models without direct paths, the paths from attachment anxiety and avoidance to the mediating social support variable were all significant (see Figures 1-4 for the standardized estimates for all paths). The paths from social support to PTSD (Figure 1), distress (Figure 2), and social functioning (Figure 4) were also significant and the path from social support to aggression was marginally significant ( $p = .06$ , see Figure 3).<sup>i</sup>

The significance of mediated effects was assessed using the distribution of products (path a\*path b) method, where path a is the path between the risk variable (attachment orientation) and the mediator (social support), and path b is between the mediator variable and the outcome (PTSD, psychological distress, aggression, and social functioning, in separate models). Asymmetric confidence intervals were calculated (using the bias corrected bootstrap method in Mplus) because the mediated effect does not always have a normal distribution (MacKinnon, 2008). They have also been shown to have the greatest power to detect mediation effects. Significant mediator effects were found for perceived social support in all of the models tested because none of the confidence intervals included zero (see Table 4 for asymmetric CIs).

## **Discussion**

Consistent with predictions, individuals with more insecure adult attachment orientations pre-PTE had greater pre-to-posttrauma changes in functioning across several indicators of well-being. Attachment anxiety assessed prior to PTE exposure was directly

related to higher levels of PTSD symptoms assessed more than 2 months post-PTE and to greater increases in psychological distress and aggression from pre to post-PTE (although the latter relation was marginally significant). Pre-PTE attachment avoidance was directly related to subsequent PTSD symptoms and to greater decreases in social functioning from pre to post-PTE. That these effects emerged across multiple domains of well being suggests that individuals who have more insecure attachment orientations are likely to be at greater risk not only for psychological distress and PTSD, but also for negative interpersonal consequences (i.e., increased aggression and loss of social connection). These results provide stronger causal evidence for the importance of attachment orientations in affecting pre- to post-PTE changes in well being than prior cross-sectional studies (e.g., Dieperink, Leskela, Thuras, & Engdahl, 2001; Solomon, Ginzburg, Mikulincer, Neria, & Ohry, 1998). These findings are also generally consistent with previous prospective studies (i.e., MacDonald, et al., 2008; Mikulincer, et al., 2004) that have documented relations between insecure attachment orientations assessed pre-trauma and subsequent PTSD symptoms. However, this is the first study to document these findings prospectively across a variety of PTEs in adults and a broader range of outcomes.

Our predictions regarding the role of perceived support in mediating the relation between adult attachment orientations and post-PTE adjustment also were supported. First, individuals with more insecure attachment orientations perceived that less positive and more negative support was available to them and engaged in more social withdrawal, and these social factors were related to poorer adjustment, consistent with past research

(e.g., Mallinckrodt & Wei, 2005). Second, consistent with predictions, these social factors mediated the relation between pre-trauma attachment insecurity and post-trauma adjustment. In other words, these findings are consistent with the notion that individuals with more insecure attachment orientations have greater decreases in adjustment from pre to post-PTE because they perceive others as less supportive and engage in more social withdrawal as a means of coping. These effects were found across a range of PTEs and across four different outcomes that should be influenced by attachment-related coping and emotion-regulation strategies. This is the first study to document these mediating effects longitudinally with more stringent standards for measuring posttrauma adjustment (i.e., assessing *changes* in outcomes from pre to post-PTE, rather than using only post-PTE measures). Notably, in contrast to previous cross-sectional research that documented the mediating effect of social support only for attachment anxiety (Besser & Neria, 2012) this study provides evidence for the mediating role of support for both attachment anxiety and attachment avoidance. The relation between avoidant attachment and posttrauma outcomes, as well as the mediating pathways observed in these data, may not be captured within cross-sectional research designs because individuals with more avoidant attachment orientations suppress their psychological distress initially and thus decrements in well-being may only emerge over time. The differences between these cross-sectional and longitudinal findings underscore the importance of incorporating more longitudinal research in the study of posttrauma responses, particularly with regard to attachment avoidance.

It is also worth noting that these findings reflect differences in *perceived* social support. Individuals who have a more insecure attachment orientation tend to underestimate the amount of support available to them. Previous research has demonstrated that more insecure attachment orientation is associated with underestimating social support from romantic partners relative to trained raters' objective ratings of support provided (e.g., Shallcross, Howland, Bemis, Simpson, & Frazier, 2011). Thus, it is likely that the mediating role of social support reflects deficits in both actual *and* perceived support.

Specifically, because individuals who are more anxiously attached use hyperactivating strategies when they are distressed, they tend to overwhelm partners from whom they seek support by wanting excessive reassurance (Shaver, Schachner, & Mikulincer, 2005) and are more often hypersensitive to indications of unhelpful support from their partners (Mikulincer & Shaver, 2007). Likewise, individuals who are higher in avoidant attachment are prone to social withdrawal and distancing coping strategies (Mikulincer, et al., 1993) and may be impervious to support attempts by others (e.g., Wei, Vogel, Ku, & Zakalik, 2005). The primary coping strategies associated with insecure attachment, then, are likely to undermine social support interactions and degrade the quality of perceived support.

Though the current findings cannot be interpreted as evidence for causal relations *per se*, due to methodological improvements upon previous research, they do offer more compelling evidence for a causal role for perceived social support in shaping posttrauma adjustment for individuals higher in attachment insecurity. They also underscore the

importance of considering both intrapersonal (e.g., attachment) and interpersonal factors (e.g., social support) in the development and persistence of posttrauma concerns.

### *Counseling Implications*

This study has several potential implications for counseling practice. First, clinicians should maintain awareness of client's attachment orientations and assess these traits whenever possible. In addition, individuals who are more insecurely attached and who have experienced a traumatic event may have particular difficulties engaging with treatment, developing helpful therapeutic relationships, and connecting with social support networks (Daniel, 2006; Mallinckrodt, Coble, & Gantt, 1995; Mallinckrodt & Wei, 2005). The PTSD treatments with the most empirical support focus on exposure and/or cognitive restructuring regarding the memory of the traumatic event, and do not incorporate any social skills training. Though a wealth of evidence supports the efficacy of these treatments to treat symptoms of PTSD (e.g., Bradley, Greene, Russ, Dutra, & Westen, 2005), they may not fully address the needs of individuals with more insecure attachment styles, who are likely to be experiencing a variety of detrimental effects following trauma exposure, including both psychological and interpersonal concerns. Thus, interventions could be devised to augment existing PTSD treatments by including social skills training to assist these individuals in garnering social support more effectively and psychoeducation to inform clients about adult attachment and the potential for biased perceptions of support.

More avoidant individuals may find encouragement to seek social support especially overwhelming and distressing because seeking social support in the wake of

trauma often involves expression of strong emotions and vulnerability in seeking validation and support from others. For example, the use of deactivating strategies has been associated with less self-reported reactivity to stress among highly avoidant individuals (see Lopez & Brennan, 2000, for a review). Some individuals, who prefer to avoid expressing strong emotions, may actually be more distressed by invitations to express themselves and experience their emotions than by the emotions themselves (see Kennedy-Moore & Watson, 2001). Due to their more avoidant working models and use of deactivating coping strategies, individuals with a more avoidant attachment orientation may have limited awareness of their own distress following exposure to traumatic events. This, in turn, may delay treatment seeking and complicate the therapeutic process. Given that the dropout rates for the most common, empirically supported treatments for PTSD are often high (ranging from 20% to 50%; see Hembree et al., 2003; Schottenbauer, Glass, Arnkoff, Tendick, & Gray, 2008), attachment avoidance or its concomitant coping strategies may contribute to the lack of effectiveness for some populations. Thus, clinicians should proceed with awareness of these factors and adjust their treatment recommendations based on individual differences in stress response patterns.

For anxiously attached people, social support is likely to be highly valued and actively sought (Mikulincer & Shaver, 2007). Despite this, I found that attachment anxiety was related to social withdrawal and perceptions of more negative social support following trauma. It is quite possible that individuals with a more anxious attachment orientation are likely to seek support, but may be unable to articulate their experiences in a manner that facilitates support. Due to reliance on hyperactivating strategies to regulate

emotions and cope with posttrauma responses, individuals higher in attachment anxiety are likely to overwhelm support providers and degrade the quality of support interactions and/or strain social networks (Mikulincer, et al., 2006). Accordingly, clinicians should encourage anxious individuals to seek support more judiciously and to develop methods for self-soothing in addition to support seeking. Psychoeducation about the effects of adult attachment may also benefit individuals with a more anxious attachment orientation.

### *Limitations*

Although this study makes several contributions to the attachment and trauma literatures, it has several limitations. First, the sample was primarily European-American/White, female, young, well-educated, and middle-class. Given that the risk for trauma exposure and responses to trauma vary according to variables such as race, gender, age, and class (Hatch & Dohrenwend, 2007), it is important for future research to replicate these findings in more diverse samples. Second, although relations between attachment and adjustment were evaluated prospectively, attachment anxiety and avoidance were measured at only one time-point (at Time 1). Thus, I was not able to assess the effects of potentially traumatic events on subsequent attachment orientation scores. Though such shifts are theoretically viable and have been observed following major, attachment-relevant life events, such as the transition to parenthood (e.g., Simpson, Rholes, Campbell, Tran, & Wilson, 2003), they have not been found in previous studies of attachment and trauma sequelae (Besser & Neria, 2010). Third, psychometric data were not currently available for the trauma questionnaire that was used

in this study. Finally, although data were gathered prospectively, intervals between data collection time points may not have been long enough to capture relevant changes in functioning, as some individuals experience delayed negative reactions to potentially traumatic events (e.g., Bonanno & Mancini, 2012).

### *Future Directions*

Future research in this area should expand on this study in a variety of ways. For example, researchers should assess attachment orientations and trauma exposure at multiple time-points to evaluate whether any reciprocal causal pathways exist between them. Adjustment also should be assessed at multiple time points to capture all relevant trajectories of changes in functioning across time (e.g., a delayed response for individuals with a more avoidant attachment orientation). Researchers should also investigate additional mediators that might account for observed relations between attachment orientations and posttrauma functioning. For example, negative coping strategies to regulate affective responses to traumatic events (e.g., avoidance coping) could act as additional mediators. Researchers may also wish to explore the counseling implications of these findings by testing the effectiveness of different trauma-related interventions designed or augmented to address perceived or actual deficits in social support in individuals who have insecure attachment orientations. Finally, future research should include non-self-report measures, which may capture responses to traumatic events that go unreported by more avoidantly attached individuals, but that may influence functioning nonetheless.

## References

- Adkins, J., Weathers, F., McDevitt-Murphy, M., & Daniels, J. (2008). Psychometric properties of seven self-report measures of posttraumatic stress disorder in college students with mixed civilian trauma exposure. *Journal of Anxiety Disorders, 22*, 1393–1402.
- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.
- Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the strange situation*. Hillsdale, NJ: Erlbaum.
- Am. Psychiatr. Assoc. 2000. *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR)*. Washington, DC: Am. Psychiatr. Assoc. 4th ed., text rev.
- American Association of Community Colleges. (2011). 2011 AACC fact sheet. Retrieved from [http://aacc.nche.edu/Advocacy/toolkit/Documents/2011\\_AACC\\_FactSheet.pdf](http://aacc.nche.edu/Advocacy/toolkit/Documents/2011_AACC_FactSheet.pdf)
- Anders, S.L., Frazier, P.A., & Frankfurt, S. (2010). Variations in criterion A and PTSD prevalence rates in a community sample of women. *Journal of Anxiety Disorders, 25*, 176–184.
- Anders, S. L., Frazier, P. A., & Shallcross, S. L. (2012). Prevalence and effects of life event exposure among undergraduate and community college students. *Journal of Counseling Psychology*,
- Anders, S. L., Shallcross, S. L., & Frazier, P. A. (2011). Beyond criterion A1: The effects

- of relational and non-relational traumatic events. *Journal of Trauma & Dissociation*, 13, 1–18.
- Anderson, C., & Alexander, P. (1996). The relationship between attachment and dissociation in adult survivors of incest. *Psychiatry*, 3, 240-254.
- Aron, A., Aron, E. N., & Smollan, D. (1992). Inclusion of Other in the Self Scale and the structure of interpersonal closeness. *Journal of Personality and Social Psychology*, 63, 596–612.
- Baldwin, M. W. (1992). Relational schemas and the processing of social information. *Psychological Bulletin*, 112, 461-484.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic and statistical considerations. *Journal of Personality and Social Psychology*, 51, 1173-1182.
- Benoit, M., Bouthillier, D., Moss, E., Rouseau, C., & Brunet, A. (2009). Emotion regulation strategies as mediators of the association between level of attachment security and PTSD symptoms following trauma in adulthood. *Anxiety, Stress, & Coping*, 23, 101-118.
- Benish-Weisman, M. (2009). Between trauma and redemption: Story form differences in immigrant narratives of successful and unsuccessful immigration. *Journal of Cross-Cultural Psychology*, 40, 953-968.
- Besser, A., & Neria, Y. (2012). When home isn't a safe haven: Insecure attachment orientations, perceived social support, and PTSD symptoms among Israeli evacuees under missile threat. *Psychological Trauma: Theory, Research, Practice, and*

*Policy*, 4, 34-46.

- Besser, A., & Neria, Y. (2010). The effects of insecure attachment orientations and perceived social support on posttraumatic stress and depressive symptoms among civilians exposed to the 2009 Israel–Gaza war: A follow-up cross-lagged panel design study. *Journal of Research in Personality*, 44, 335–341.
- Bonanno, G., & Mancini, A. (2012) Beyond resilience and PTSD: Mapping the heterogeneity of responses to potential trauma. *Psychological Trauma: Theory, Research, Practice, and Policy*, 4, 74-83.
- Bowlby, J. (1969). Attachment and loss: Vol. 1. Attachment. New York: Basic Books.
- Bowlby, J. (1973). *Attachment and loss: Vol. 2. Separation*. New York, NY: Basic Books.
- Bowlby, J. (1980). *Attachment and loss: Vol. 3. Loss*. New York, NY: Basic Books.
- Bradley, R., Greene, J., Russ, E., Dutra, L., & Westen, D. (2005). A multidimensional meta-analysis of psychotherapy for PTSD. *American Journal of Psychiatry*, 162, 214–227.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3, 77 -101.
- Brennan, K., Clark, C., & Shaver, P. R. (1998). Self-report measurement of adult attachment: An integrative overview. In J. A. Simpson & W. S. Rholes (Eds.), *Attachment theory and close relationships* (pp. 46–76). New York: Guilford Press.
- Brewin, C.R., Andrews, B., & Valentine, J.D. (2000). Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. *Journal of Consulting and*

*Clinical Psychology*, 68, 748–66.

- Browne, C., & Winkelman, C. (2007). The effect of childhood trauma on later psychological adjustment. *Journal of Interpersonal Violence*, 22, 648-697.
- Burt, S., & Donnellan, M. (2010). Evidence that the Subtypes of Antisocial Behavior questionnaire (STAB) predicts momentary reports of acting-out behaviors. *Personality and Individual Differences*, 48, 917-920.
- Charuvastra, A., & Cloitre, M. (2008). Social bonds and posttraumatic stress disorder. *Annual Review of Psychology*, 59, 301-28.
- Cheung, G. W., & Rensvold, R. B. (2002). Evaluating Goodness-of-Fit Indexes for Testing Measurement Invariance. *Structural Equation Modeling*, 9, 233-255.
- Collins, N. L., & Feeney, B. C. (2000). A safe haven: An attachment theory perspective on support-seeking and care-giving processes in intimate relationships. *Journal of Personality and Social Psychology*, 78, 1053-1073.
- Collins, N. L., & Read, S. J. (1994). Cognitive representations of attachment: The structure and function of working models. In K. Bartholomew & D. Perlman (Eds.), *Attachment processes in adulthood. Advances in personal relationships* (Vol. 5, pp. 53-90). London: Jessica Kingsley.
- Daniel, S. I. F. (2006). Adult attachment patterns and individual psychotherapy: A review. *Clinical Psychology Review*, 26, 968-984.
- Declercq, F., & Willemsen, J. (2006). Distress and post-traumatic stress disorders in high risk professionals: adult attachment style and the dimensions of anxiety and avoidance. *Clinical Psychology Psychotherapy*, 13, 256-263.

- Derogatis, L. (1993). *Manual for the Brief Symptom Inventory*. Minneapolis, MN: National Computer Systems.
- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment*, *49*, 71–75.
- Dieperink, M., Leskela, J., Thuras, P., & Engdahl, B. (2001). Attachment style classification and posttraumatic stress disorder in former prisoners of war. *American Journal of Orthopsychiatry*, *71*, 374-378.
- Feeney, J. A. (2008). Adult romantic attachment: Developments in the study of couple relationships. In J. Cassidy & P. R. Shaver (Eds.), *The handbook of attachment: Theory, research, and clinical applications* (2nd ed., pp. 456–481). New York: Guilford Press.
- Feeney, B. C., & Kirkpatrick, L. A. (1996). Effects of adult attachment and presence of romantic partners on physiological responses to stress. *Journal of Personality and Social Psychology*, *70*, 255–270.
- Fiese, B. H., & Spagnola, M. (2005). Narratives in and about families: An examination of coding schemes. *Journal of Family Psychology*, *19*, 51– 61.
- Fletcher, G. J. O., Simpson, J. A., & Thomas, G. (2000). The measurement of perceived relationship quality components: A confirmatory factor analytic approach. *Personality and Social Psychology Bulletin*, *26*, 340-354.
- Fraley, R. C., Waller, N. G., & Brennan, K. A. (2000). An item response theory analysis of self-report measures of adult attachment. *Journal of Personality and Social Psychology*, *78*, 350–365.

- Frazier, P. (2012). Trauma psychology. In Altmaier, E. M., & Hansen, J. C. (Eds.), *The Oxford handbook of counseling psychology*. New York: Oxford University Press.
- Frazier, P., Keenan, N., Anders, S., Perera, S., Shallcross, S., & Hintz, S. (2011). Past, present, and future control and adjustment to stressful life events. *Journal of Personality and Social Psychology, 100*, 749–765.
- Frazier, P., Gavian, M., Hirai, R., Park, C., Tennen, H., Tomich, P., & Tashiro, T. (2009). Prospective predictors of PTSD symptoms: Direct and mediated relations. *Psychological Trauma: Theory, Research, Practice, and Policy, 3*, 27–36.
- Frazier, P. A., Tix, A. P., & Barron, K. E. (2004). Testing moderator and mediator effects in counseling psychology research. *Journal of Counseling Psychology, 51*, 115-134.
- Gable, S. L., Gonzaga, G. C., & Strachman, A. (2006). Will you be there for me when things go right? Supportive responses to positive event disclosures. *Journal of Personality and Social Psychology, 91*, 904–917.
- Gable, S. L., Reis, H. T., Impett, E. A., & Asher, E. R. (2004). What do you do when things go right? The intrapersonal and interpersonal benefits of sharing positive events. *Journal of Personality and Social Psychology, 87*, 228-245.
- Hatch, S., Dohrenwend, B. (2007). Distribution of traumatic and other stressful life events by race/ethnicity, gender, SES and age: a review of the research. *American Journal of Community Psychology, 40*, 313-332.
- Hazan, C., & Shaver, P. (1987). Romantic love conceptualized as an attachment process. *Journal of Personality and Social Psychology, 52*, 511-524.

- Hembree, E. A., Foa, E. B., Dorfan, N. M., Street, G. P., Kowalski, J., & Tu, X. (2003). Do patients drop out prematurely from exposure therapy for PTSD? *Journal of Traumatic Stress, 16*, 555–562.
- Hu, L., & Bentler, P. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*, 1–55.
- Ingram, K.M., Betz, N.E., Mindes, E.J., Schmitt, M.M., & Grant, N. (2001). Unsupportive responses from others concerning a stressful life event: Development of the unsupportive social interactions inventory. *Journal of Social and Clinical Psychology, 20*, 173-207.
- Jenkinson, C., Coulter, A., Wright, L. (1993). Short form 36 (SF 36) health survey questionnaire: normative data for adults of working age. *BMJ, 306*, 1437-1440.
- Kennedy-Moore, E., & Watson, J. (2001). How and when does emotional expression help? *Review of General Psychology, 5*, 187–212.
- Kessler, R.C., Sonnega, A., Bromet, E., Hughes, M., & Nelson, C.B. (1995). Posttraumatic stress disorder in the National Comorbidity Survey. *Archives of General Psychiatry, 52* (12), 1048–1060.
- Kline, R. B. (2005). *Principles and practice of structural equation modeling* (2nd ed.). New York, NY: Guilford Press.
- Koenen, K.C., Stellman, J. M., Stellman, S.D., & Sommer J.F. (2003). Risk factors for course of post-traumatic stress disorder among Vietnam veterans: a 14-year follow-up of American Legionnaires. *Journal of Consulting and Clinical*

*Psychology*, 71, 980–86.

- Kraemer, H. C., Stice, E., Kazdin, A., Offord, D., & Kupfer, D. (2001). How do risk factors work together? Mediators, moderators, and independent, overlapping, and proxy risk factors. *American Journal of Psychiatry*, 158, 848–856.
- Kubany, E. S., Leisen, M. B., Kaplan, A. S., Watson, S. B., Haynes, S. N., Owens, J. A., Burns, K. (2000) Development and preliminary validation of a brief broad-spectrum measure of trauma exposure: The Traumatic Life Events Questionnaire. *Psychological Assessment*, 12, 210-224.
- Kubany, E. (2004). *Traumatic Life Events Questionnaire and PTSD Screening and Diagnostic Scale*. Los Angeles, CA: Western Psychological Services.
- Lee, R. M., Draper, M., & Lee, S. (2001). Social connectedness, dysfunctional interpersonal behaviors, and psychological distress: Testing a mediator model. *Journal of Counseling Psychology*, 48, 310–318.
- Little, T. D., Cunningham, W. A., Shahar, G., & Widaman, K. F. (2002). To parcel or not to parcel: Exploring the question, weighing the merits. *Structural Equation Modeling*, 9, 151–173.
- Lopez, F. G., & Brennan, K. A. (2000). Dynamic processes underlying adult attachment organization: Toward an attachment theoretical perspective on the healthy and effective self. *Journal of Counseling Psychology*, 47, 283–301.
- MacCallum, R. C., Widaman, K. F., Zhang, S., & Hong, S. (1999). Sample size in factor analysis. *Psychological Methods*, 4, 84-99.
- MacDonald, H., Beeghly, M., Grant-Knight, W., Augustyn, M., Woods, R., Cabral, H., et

- al. (2008). Longitudinal association between infant disorganized attachment and childhood posttraumatic stress symptoms. *Development and Psychopathology, 20*, 493-508.
- MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. (2002). A comparison of methods to test mediation and other intervening variable effects. *Psychological Methods, 7*, 83–104.
- MacKinnon, D. (2008). *Introduction to statistical mediation analysis*. New York: Erlbaum.
- Main, M., & Goldwyn, R. (1996). *An adult classification system*. Unpublished manuscript, University of California, Berkeley.
- Mallinckrodt, B., Coble, H. M., & Gantt, D. L. (1995). Working alliance, attachment memories, and social competencies of women in brief therapy. *Journal of Counseling Psychology, 42*, 79–84.
- Mallinckrodt, B., & Wei, M. (2005). Attachment, social competencies, social support, and psychological distress. *Journal of Counseling Psychology, 52*, 358-367.
- McHorney, C.A., Ware, J.E., & Raczek, A.E. (1993). The MOS 26-Item Short-Form Health Survey (SF-36): II. Psychometric and clinical tests of validity in measuring physical and mental health constructs. *Medical Care, 31*, 247-263.
- McIntosh, M. F., & Rouse, C. E. (2009, February). The other college: Retention and completion rates among two-year college students. Retrieved from [http://www.americanprogress.org/issues/2009/02/pdf/two\\_year\\_colleges.pdf](http://www.americanprogress.org/issues/2009/02/pdf/two_year_colleges.pdf)
- McLean, K. (2005). Late adolescent identity development: Narrative meaning making

and memory telling. *Developmental Psychology*, 41, 683-691.

Mikulincer, M. (1998). Attachment working models and the sense of trust: an exploration of interaction goals and affect regulation. *Journal of Personality and Social Psychology*, 74, 1209-1224.

Mikulincer, M., & Florian, V. (1995). Appraisal of and coping with a real-life stressful situation—The contribution of attachment styles. *Personality and Social Psychology Bulletin*, 21, 406–414.

Mikulincer, M., Florian, V., & Tolmatz, R. (1990). Attachment styles and fear of personal death: A case study of affect regulation. *Journal of Personality and Social Psychology*, 58, 273-280.

Mikulincer, M., Florian, V., & Weller, A. (1993). Attachment styles, coping strategies, and posttraumatic psychological distress: The impact of the Gulf War in Israel. *Journal of Personality and Social Psychology*, 64, 817-826.

Mikulincer, M., Gillath, O., & Shaver, P. R. (2002). Activation of the attachment system in adulthood: Threat-related primes increase the accessibility of mental representations of attachment figures. *Journal of Personality and Social Psychology*, 83, 881-895.

Mikulincer, M., Shaver, P. R. (2003). The Attachment Behavioral System in Adulthood: Activation, Psychodynamics, and Interpersonal Processes. In M. P. Zanna (Ed.), *Advances in experimental social psychology*, Vol. 35. (pp. 53-152). San Diego, CA: Elsevier Academic Press.

- Mikulincer, M., & Shaver, P. R. (2007). *Attachment in adulthood: Structure, dynamics, and change*. New York: Guilford Press.
- Mikulincer, M., Shaver, P. R., Horesh, N. (2006). Attachment Bases of Emotion Regulation and Posttraumatic Adjustment. In Snyder, D. K., Simpson, J., Hughes, J. N. (Eds.), *Emotion regulation in couples and families: Pathways to dysfunction and health*. (pp. 77-99). Washington, DC: American Psychological Association.
- Murray, S. L., Bellavia, G. M., Rose, P., & Griffin, D. W. (2003). Once hurt, twice hurtful: How perceived regard regulates daily marital interactions. *Journal of Personality and Social Psychology, 84*, 126-147.
- O'Connor, M., & Elklit, A. (2008). Attachment styles, traumatic events, and PTSD: a cross-sectional investigation of adult attachment and trauma. *Attachment & Human Development, 10*, 59-71.
- Ozer, E., Best, S., Lipset, T., & Weiss, D. (2003). Predictors of posttraumatic stress disorder and symptoms in adults: A meta-analysis. *Psychological Bulletin, 129*, 52-73.
- Paris, J. (2000). Predispositions, personality traits and Posttraumatic Stress Disorder. *Harvard Review of Psychiatry, 8*, 175-183.
- Reis, H. T. (2003). *A self-report measure of perceived partner responsiveness*. Unpublished data, University of Rochester.
- Rempel, J. K., Holmes, J.G., & Zanna, M. P. (1985). Trust in close relationships. *Journal of Personality and Social Psychology, 49*, 95-112.

- Rholes, W. S., Simpson, J. A., & Orina, M. M. (1999). Attachment and anger in an anxiety-provoking situation. *Journal of Personality and Social Psychology, 76*, 940–957.
- Russell, D., Peplau, L. A., & Cutrona, C. E. (1980). The revised UCLA Loneliness Scale: Concurrent and discriminant validity evidence. *Journal of Personality and Social Psychology, 39*, 472–480.
- Russell, D. (1996). UCLA Loneliness Scale (Version 3): Reliability, validity, and factor structure. *Journal of Personality Assessment, 66*, 20–40.
- Salo, J. A., Qouta, S., & Punamaki, R. (2005). Adult attachment, posttraumatic growth and negative emotions among former political prisoners. *Anxiety, Stress, and Coping, 18*, 361–378.
- Schlomer, G. L., Bauman, S., & Card, N. A. (2010). Best practices for missing data management in counseling psychology. *Journal of Counseling Psychology, 57*, 1–10.
- Shallcross, S., Howland, M., Bemis, J., Simpson, J. A., & Frazier, P. (2011). Not “capitalizing” on social capitalization interactions: The role of attachment insecurity. *Journal of Family Psychology, 25*, 77–85.
- Shaver, P. R., Schachner, D. A., & Mikulincer, M. (2005). Attachment style, excessive reassurance seeking, relationship processes, and depression. *Personality and Social Psychology Bulletin, 31*, 343–359.
- Sherbourne, C., & Stewart, A. (1991). The MOS social support survey. *Social Science and Medicine, 32*, 705–714.

- Simpson, J. A. (1990). Influence of attachment styles on romantic relationships. *Journal of Personality and Social Psychology, 59*, 971–980.
- Simpson, J. A., & Rholes, W. S. (2012). Adult attachment orientations, stress, and romantic relationships. In P. Devine & A. Plant (Eds.) *Advances in Experimental Psychology*, (p. 279-328). Burlington: Academic Press.
- Simpson, J. A., Rholes, W. S., Campbell, L., Tran, S., & Wilson, C. L. (2003). Adult attachment, the transition to parenthood, and depressive symptoms. *Journal of Personality and Social Psychology, 84*, 1172–1187.
- Simpson, J. A., Rholes, W. S., & Nelligan, I. S. (1992). Support seeking and support giving within couples in an anxiety-provoking situation: The role of attachment styles. *Journal of Personality and Social Psychology, 62*, 434-446.
- Simpson, J. S., Rholes, W. S., Orina, M. M., & Grich, J. (2002). Working models of attachment, support giving, and support seeking in a stressful situation. *Personality and Social Psychology Bulletin, 28*, 598–608.
- Simpson, J. A., Rholes, S. W., & Phillips, D. (1996). Conflict in close relationships: An attachment perspective. *Journal of Personality and Social Psychology, 71*, 899-914.
- Solomon, Z., Dekel, R., & Mikulincer, M. (2008). Complex trauma of war captivity: A prospective study of attachment and post-traumatic stress disorder. *Psychological Medicine, 38*, 1427-1434.
- Solomon, Z., Ginzburg, K., Mikulincer, M., Neria Y., & Ohry A. (1998). Coping with war captivity: The role of attachment style. *European Journal of Personality, 12*, 271-285.

- Solomon, Z., Shklar, R. & Mikulincer, M. (2005). Frontline treatment of combat stress disorder: A 20-year longitudinal evaluation. *American Journal of Psychiatry*, *162*, 2309-2314.
- Tobin, D. L., Holroyd, K. A., & Reynolds, R. V. C. (1984). *User's manual for the Coping Strategies Inventory*. Athens, OH: Ohio University.
- Tobin, D. L., Holroyd, K. A., Reynolds, R. V., & Wigan, J. K. (1989). The hierarchical factor structure of the Coping Strategies Inventory. *Cognitive Therapy and Research*, *13*, 343-361.
- Wallace, J. L., & Vaux, A. (1993). Social support network orientation: The role of adult attachment style. *Journal of Social and Clinical Psychology*, *12*, 354-365.
- Ware, J.E. & Kosinski, M. (2001). *SF-36 Physical and Mental Health Summary Scales: A Manual for Users of Version 1* (2nd edition ed.), QualityMetric Inc.: Lincoln, RI.
- Ware, J.E., Snow, K.K., Kosinski, M., & Gandek. (1993). *Scoring the SF-36. SF-36 health survey manual and interpretation guide*. The Health Institute, New England Medical Center: Boston, MA.
- Weathers, F. W., Keane, T. M., & Davidson, J. R. T. (2001). Clinician-Administered PTSD Scale: A review of the first ten years of research. *Depression and Anxiety*, *13*, 132-156.
- Weathers, F. W., Litz, B. T., Herman, D. S., Huska, J. A., & Keane, T. M. (1993). *The PTSD Checklist: Reliability, validity, and diagnostic utility*. Paper presented at the annual meeting of the International Society for Traumatic Stress Studies, San Antonio, TX.

Wei, M., Heppner, P. P., & Mallinckrodt, B. (2003). Perceived coping as a mediator between attachment and psychological distress: A structural equation modeling approach. *Journal of Counseling Psychology, 50*, 438 – 447.

Wei, M., Vogel, D., Ku, T., & Zakalik, R. (2005). Adult attachment, affect regulation, negative mood, and interpersonal problems: The mediating roles of emotional reactivity and emotional cutoff. *Journal of Counseling Psychology, 52*, 14-24.

Zakin, G., Solomon, Z., & Neria, Y. (2003). Hardiness, attachment style, and long term psychological distress among Israeli POWs and combat veterans. *Personality and Individual Differences, 34*, 819-829.

## APPENDIX A

Tables and figures for the main analyses of the dissertation are included in this appendix.

Table 1 - *Descriptive Data and Correlations for Measures of Attachment, Mediating Variables, and Outcome Variables*

	1	2	3	4	5	6	7	8	9
M	3.52	3.41	4.05	1.89	2.17	1.60	1.57	.00	1.32
SD	1.08	1.12	.82	.72	.99	.70	.66	.52	.28
1. AAQ-AN									
2. AAQ-AV	.36***								
3. MOS (T2)	-.38***	-.32***							
4. USII (T2)	.22***	.19***	-.21***						
5. CSI-SW (T2)	.26***	.34***	-.29***	.31***					
6. PCL-S (T3)	.30***	.27***	-.22**	.44***	.36***				
7. BSI (T3)	.38***	.28***	-.28***	.44***	.41***	.78***			
8. BSI (T1T3rs)	.28***	.03	-.12	.25***	.22**	.56***	.80***		
9. STAB (T3)	.19*	.18*	-.13†	.42***	.29***	.42***	.54***	.40***	
10. STAB (T1T3rs)	.05	.14†	-.09	.38***	.17*	.38***	.48***	.47***	.87***
11. UCLA (T3)	-.29***	-.43***	.41***	-.30***	-.47***	-.45***	-.60***	-.33***	-.29***
12. UCLA (T1T3rs)	-.00	-.18*	.18*	-.12	-.15*	-.23**	-.35***	-.33***	-.14†
13. SCS (T3)	-.28***	-.40***	.38***	-.18*	-.37***	-.37***	-.48***	-.26***	-.26***
14. SCS (T1T3rs)	-.01	-.06	.18*	-.03	-.10	-.19**	-.24**	-.28***	-.10

*Descriptive Data and Correlations for Measures of Attachment, Mediating Variables, and Outcome Variables*

	10	11	12	13	14
M	.00	2.94	.00	4.48	.00
SD	.24	.79	.58	.84	.55
1. AAQ-AN					
2. AAQ-AV					
3. MOS (T2)					
4. USII (T2)					
5. CSI-SW (T2)					
6. PCL-S (T3)					
7. BSI (T3)					
8. BSI (T1T3rs)					
9. STAB (T3)					
10. STAB (T1T3rs)					
11. UCLA (T3)	-.21**				
12. UCLA (T1T3rs)	-.18*	.74***			
13. SCS (T3)	-.20**	.76***	.50***		
14. SCS (T1T3rs)	-.15†	.38***	.46***	.65***	

Table 2  
*Measurement Model Factors Loadings*

	Standardized Estimate	Unstandardized Estimate
Attachment Anxiety (at T1)		
Parcel 1	.86	1.00
Parcel 2	.85	1.12
Parcel 3	.86	0.85
Attachment Avoidance (at T1)		
Parcel 1	.84	1.00
Parcel 2	.87	1.09
Parcel 3	.79	1.05
Social Support (at T2)		
MOS SSS	.54	1.00
USII	-.66	-1.06
CSI-SW	-.61	-1.35
PTSD (PCL-S) (at T3)		
Parcel 1	.89	1.00
Parcel 2	.87	1.09
Parcel 3	.87	.92
Psychological Distress (T1-T3 residual score)		
BSI – Depression	.81	1.00
BSI – Anxiety	.80	.75
BSI – Hostility	.80	.82
Aggression (T1-T3 residual score)		
STAB – Social Aggression	.72	1.00
STAB – Rule Breaking	.54	.44
Social Functioning (T1-T3 residual score)		
UCLA Loneliness Scale	.80	1.00
Social Connectedness Scale	.58	.68

*Note.*  $N = 182$ . PCL-S = PTSD Checklist – Specific Version, BSI = Brief Symptom Inventory, STAB = Subtypes of Antisocial Behavior Questionnaire. All factor loadings were significant at the  $p < .001$  level.

Table 3  
*Fit Statistics for Measurement and Structural Models*

Models	df/x <sup>2</sup>	CFI	RMSEA/90%CI	SRM R
1. Measurement model	131/(198.91)***	.96	.05(.04, .07)	.05
2. Full mediation model (without direct paths) for PTSD	50/(68.92)*	.98	.05(.01, .07)	.05
3. Full mediation model (without direct paths) for BSI	50/(58.09)	.99	.03(.00, .06)	.06
4. Full mediation model (without direct paths) for STAB	40/(59.20)*	.98	.05(.02, .08)	.05
5. Full Mediation model (without direct paths) for Social Functioning	40/(45.17)	.99	.03(.00, .06)	.05
6. Partial mediation model (with direct paths) for PTSD	48/(68.39)*	.98	.05(.02, .07)	.05
7. Partial mediation model (with direct paths) for BSI	48(49.82)	.99	.01(.01, .05)	.04
8. Partial mediation model (with direct paths) for STAB	38/(55.41)*	.98	.05(.01, .08)	.05
9. Partial mediation model (with direct paths) for Social Functioning	38/(41.64)	.99	.02(.00, .06)	.04

Table 4  
*Tests of Mediated Effects*

Mediated effects	Standardized a	Unstandardized a (SE)	Standardized b	Unstandardized b (SE)	a*b	95% CI
Attachment Anxiety						
Social Support –PTSD	-.35**	-.16(.06)	-.60*	-.91(.40)	.21	.03, .27
Social Support –BSI	-.39**	-.13(.04)	-.41**	-.44(.19)	.16	.02, .18
Social Support –STAB	-.35**	-.17(.07)	-.38†	-.25(.14)	.09	.01, .10
Social Support –Social Functioning	-.34***	-.18(.07)	.28**	.27(.10)	-.10	-.09, -.01
Attachment Avoidance						
Social Support –PTSD	-.38***	-.15(.05)	-.60*	-.91(.40)	.23	.06, .27
Social Support –BSI	-.36**	-.17(.07)	-.41**	-.44(.19)	.15	.02, .18
Social Support –STAB	-.37**	-.15(.05)	-.38†	-.25(.14)	.14	.02, .08
Social Support –Social Functioning	-.41**	-.18(.05)**	.28**	.27(.10)	-.11	-.11, -.01

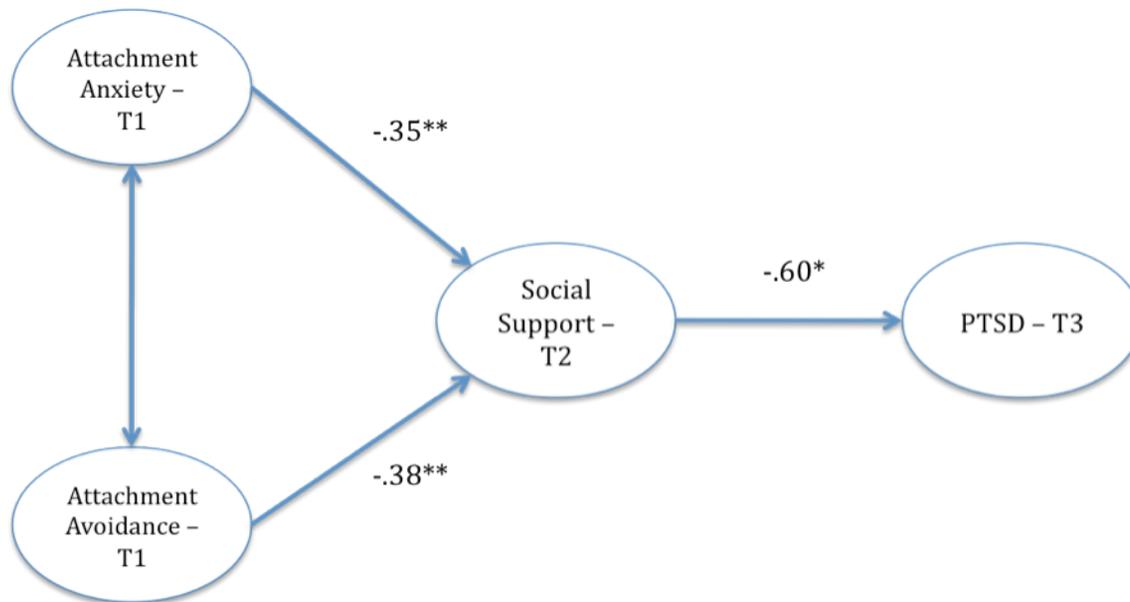


Figure 1. Social Support Mediation Model for Attachment Predicting PTSD

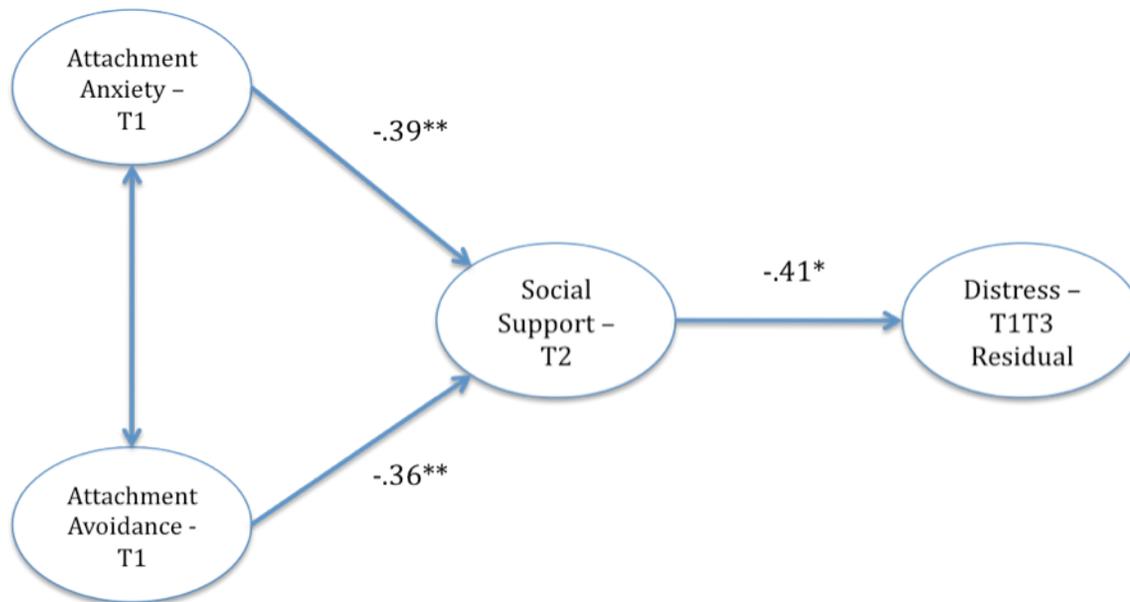


Figure 2. Social Support Mediation Model for Attachment Predicting Psychological Distress

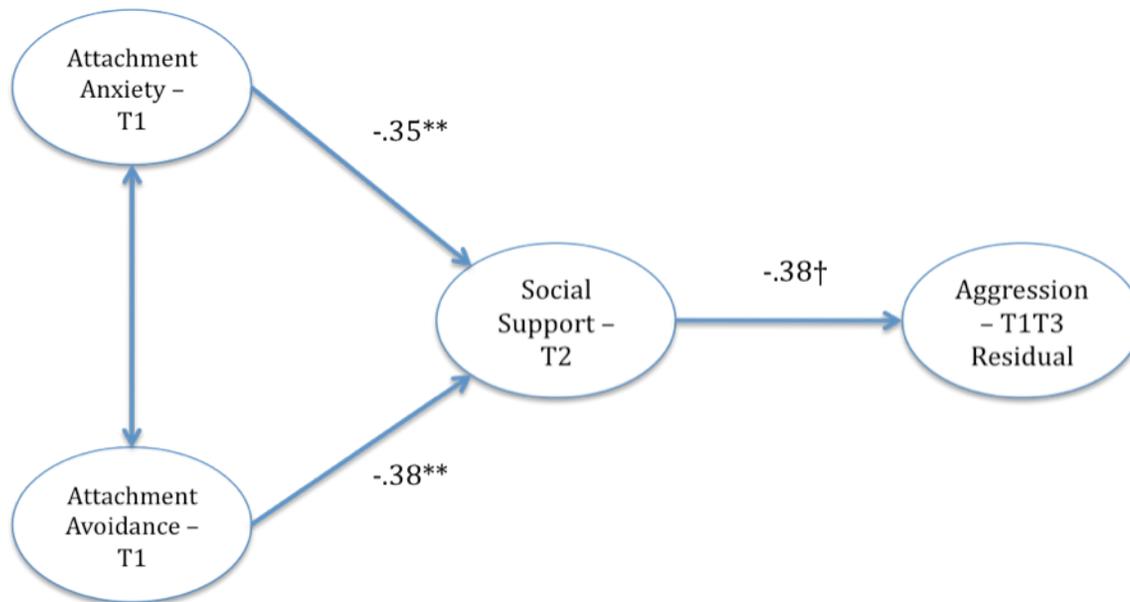


Figure 3. Social Support Mediation Model for Attachment Predicting Aggression

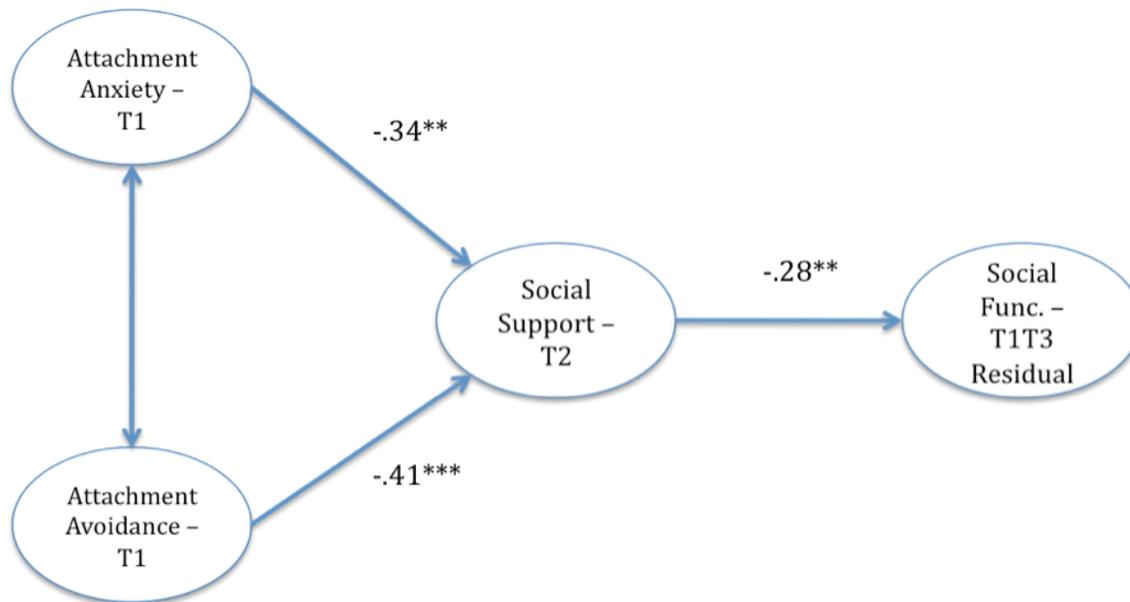


Figure 4. Social Support Mediation Model for Attachment Predicting Social Functioning

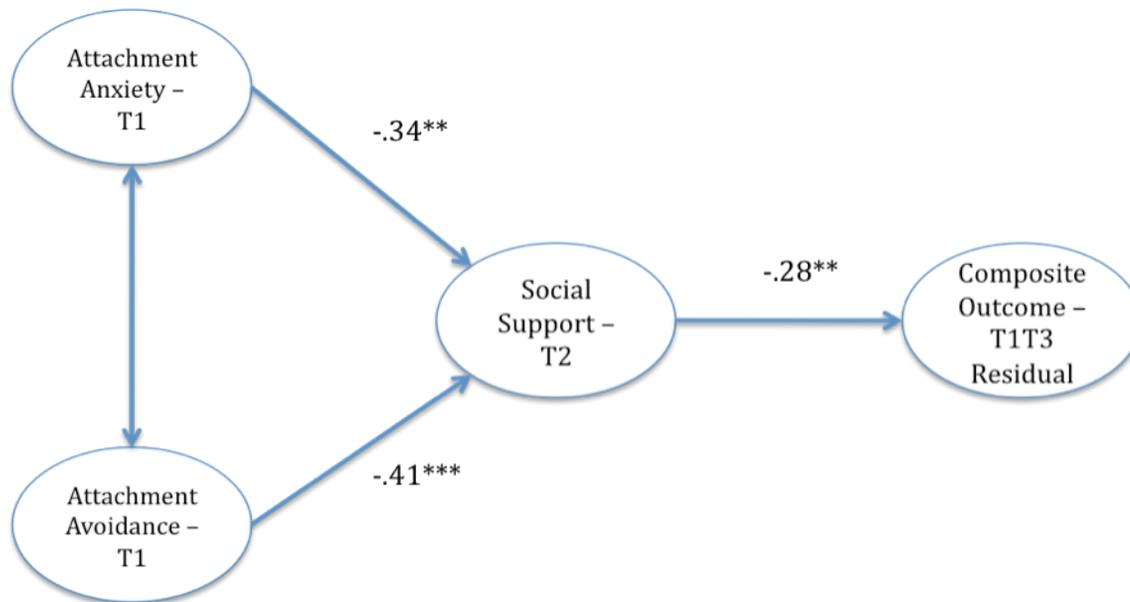


Figure 5. Social Support Mediation Model for Attachment Predicting Composite Outcome

## APPENDIX B

### Additional Hypotheses and Analyses

In this appendix I have included all of the analyses relevant to the hypotheses in my dissertation proposal. Please note that in testing hypotheses 1a-e, a subsample of individuals who experienced an interim PTE at T2 ( $N = 556$ ) were selected from the full T2 sample ( $N = 789$ ). To make use of the largest sample of relevant data possible, all 556 participants who experienced an event between T1 and T2 were included in initial analyses.. For hypotheses involving relationship variables, the sample size ( $N = 222$ ) reflects the portion of the sample that reported being in a romantic relationship at the time of the T2 survey. For analyses pertaining to hypotheses 2a-5, the sample is consistent with the one described in the body of the dissertation.

Please note that several variables were available in this data to assess psychological, physical, social and relational well being. To review, the dependent variables included indices of psychological well-being (PTSD symptoms, depression, anxiety, and hostility), physical well being (general physical well being, eating and drinking behaviors), social functioning (loneliness, social connectedness), and relational well being (closeness, trust, felt security, perceived responsiveness, relationship quality). The potential mediating variables of social support and narrative quality were also assessed using multiple measures. Social support was assessed using three self-report measures (positive and negative social support and social withdrawal). Narrative quality was assessed using multiple narrative codes (cognitive and emotional processing, meaning-making). Wherever possible, to simplify my review of analyses, I will refer to

these classes of dependent and mediating variables by general category (e.g., ‘social support measures’).

*Attachment and Changes in Functioning from Time 1 to Time 2*

**Hypothesis 1a: I predict that more insecurely attached individuals in the PTE group will report changes in adjustment indicators (including measures of psychological, physical, social, and relational well-being) from pre- to post-interim trauma (i.e., from Time 1 to Time 2). Further, I predict that the changes in posttraumatic adjustment will differ for individuals higher in attachment anxiety versus avoidance (e.g., higher reported emotional distress associated with more anxious attachment and lower reported physical health associated with more avoidant attachment) consistent with previous research.**

For each of these variables pre-to-post trauma changes reported by participants were measured by partialing pre-trauma ratings of outcome measures (at T1) from post-trauma measures (at T2). Prior to analysis, all independent variables were grand-mean centered (Aiken & West, 1991), and all dependent variables were left uncentered. Linear regression analyses were used to assess the effects of attachment on changes in functioning.

Although these hypotheses are framed in terms of insecure and secure attachment dimensions, previous findings have been mixed in terms of relations for anxious, avoidant, and fearful attachment. Therefore, these analyses were conducted using the subscales of the AAQ and their interaction. Low scores on both the anxiety and avoidance subscales may be interpreted as an indication of secure attachment orientation,

whereas higher scores on both subscales indicate fearful attachment. For initial analyses, then, the Anxious and Avoidant subscales of the AAQ and the Anxious\*Avoidant (to assess for secure/fearful attachment) interaction term were entered as predictors in the regression model. Dependent variables included the psychological, physical, social, and relational well-being measures listed above. Each dependent variable was examined in a separate regression analysis.

Multiple regression analyses were used to assess whether pretrauma attachment predicted changes in functioning (see the following Table 1a for a detailed summary of results).

Table 1a

*Simultaneous Regression Analyses Assessing Relations among Pre-PTE Attachment Orientations and Changes in Posttrauma Adjustment from T1 to T2*

Outcome	Anxiety	Avoidance	Anxiety* Avoidance	Adj. R <sup>2</sup>	F
Event-Specific Distress					
PCL-S (at T2)	.21***	.18***	.01	.10	20.78***
General Psychological Well-being					
BSI	.13**	.01	.00	.01	3.49*
SF-12, MCS	-.09*	-.05	.01	.01	2.62*
SWLS	-.06	-.03	.03	.00	1.83
Physical Well-being					
SF-12, PCS	-.06	-.04	.10*	.01	3.40*

Smoking	.13**	.04	.17***	.04	8.87***
Drinking	-.03	-.01	.04	.00	.67
Binge Drinking	.04	-.02	.14*	.01	1.94
Aggression					
STAB	.09†	-.01	-.05	.01	1.85*
Social Functioning					
Loneliness	-.12*	-.04	.07	.02	2.94*
SCS	-.01	.00	.03	.00	.92
Relationship Well-being					
IOS	-.12†	-.01	-.02	.00(2)	1.15
Trust Scale	.04	-.03	.12†	.02	2.90*
MFS	-.12†	.02	.13†	.03	3.13*
Responsiveness	-.09	-.01	.16*	.03	3.54*
PRQC	-.08	-.03	.07	.00	1.45

---

*Note.* Sample Ns = 541-551, Relationship Sample Ns = 228-230. †  $p < .10$  \*  $p < .05$  \*\*  $p < .01$  \*\*\*  $p < .001$ .

Values are standardized beta weights with both attachment subscales and their interaction entered in each model. PCL-S = PTSD Checklist – Specific Version. BSI = Brief Symptom Inventory depression, anxiety, hostility subscales. SF-12 MCS = SF-12 Mental Health Composite Scale, SWLS = Satisfaction with Life Scale, SF-12 PCS = SF-12 Physical Health Composite Scale, STAB = Subtypes of Antisocial Behavior

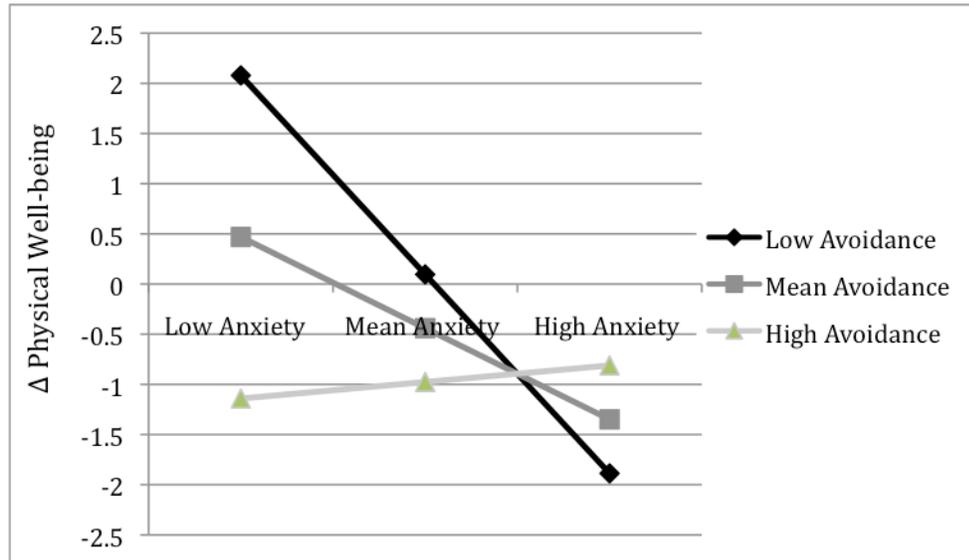
Questionnaire, SCS = Social Connectedness Scale, IOS = Inclusion of Other in the Self Scale, MFS = Murray's Felt Security Scale, PRQC = Perceived Quality Components Scale. All outcome measures are T1-T2 residual scores.

Overall, attachment anxiety was the strongest predictor across outcomes. Attachment anxiety predicted more PTSD symptoms related to the interim event at time 2, increased general psychological distress, decreased mental well-being, and increased smoking and marginally related to aggression. In addition, for those in romantic relationships, marginal effects were found for attachment anxiety predicting decreased closeness and felt security. Attachment avoidance predicted greater PTSD symptoms related to the interim event at time 2, but did not predict changes in other outcome measures.

Some effects for the interaction between attachment anxiety and attachment avoidance were also found. First, a significant interaction effect for anxiety\*avoidance was found for general physical well-being such that individuals with a secure attachment maintained Time 1 levels of physical well-being, while the sample as a whole decreased slightly. Individuals with a more anxious attachment orientation showed the greatest decreases in physical well-being. See Figure 1a here for illustration of the interaction effect.

Figure 1a

*Attachment Anxiety\*Avoidance Interaction Effect Predicting Changes in Physical Well-being*



Significant interaction effects were also found for smoking and binge drinking behaviors. For smoking, the interaction effect suggested that individuals with a fearful attachment orientation increased this risky health behavior, while individuals with more secure, avoidant, or anxious orientations increased smoking less so or decreased. For binge drinking, the pattern is quite similar, except that secure individuals also report an increase in drinking. See following Figures 1b and 1c for an illustration of these effects.

Figure 1b

*Attachment Anxiety\*Avoidance Interaction Effect Predicting Changes in Smoking*

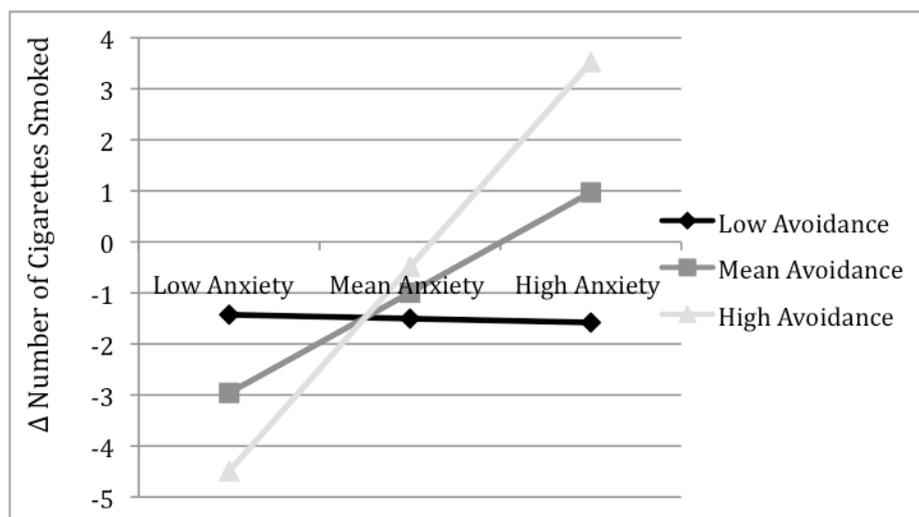
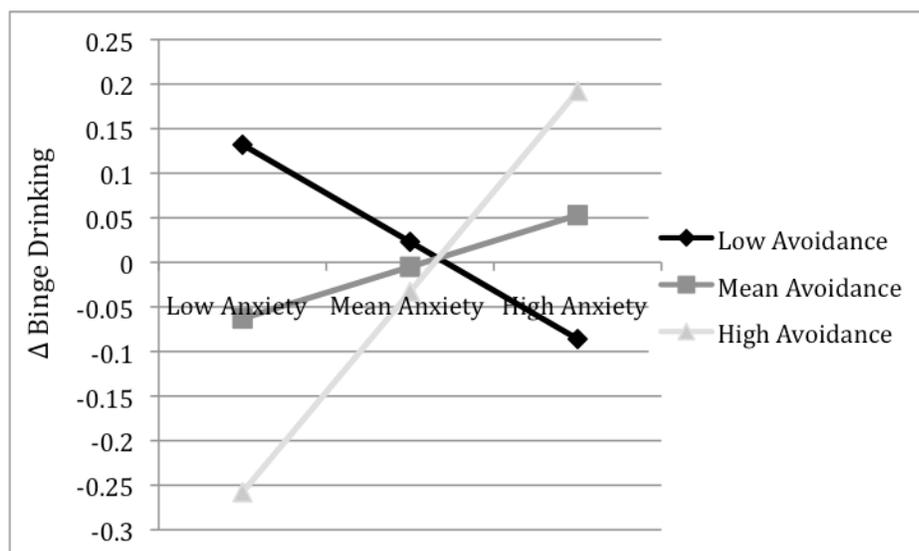


Figure 1c

*Attachment Anxiety\*Avoidance Interaction Effect Predicting Changes in Binge Drinking*

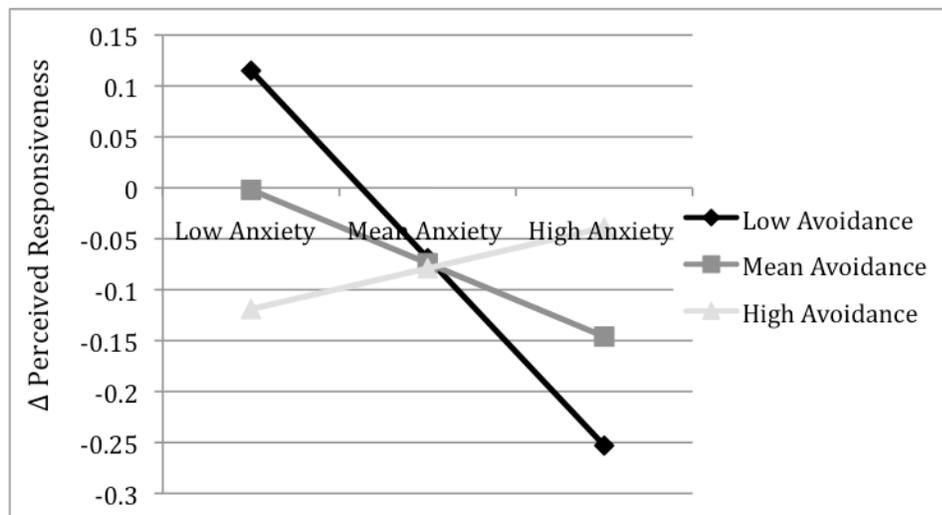


Finally, a significant anxiety\*avoidance interaction was found for perceived responsiveness, such that secure individuals maintained a high level of perceived

responsiveness relative to other partnered respondents. Individuals with a high degree of attachment anxiety and a low degree of avoidance showed the greatest decreases in perceived responsiveness from their relationship partner. See following Figure 1d for an illustration of this effect.

Figure 1d

*Attachment Anxiety\*Avoidance Interaction Effect Predicting changes in Perceived Responsiveness*



Because the interaction effects observed for anxiety\*avoidance were not consistent in terms of the nature of the interaction (i.e., its interpretation) or across indicators of well being, it was determined that the interaction should be dropped from further analyses.

**Hypothesis 1b & 1c: Within the PTE group, I predict that the observed relations between attachment and changes in functioning from pre-to-post trauma will be moderated by two characteristics of the event itself (i.e., interpersonal vs. non-interpersonal, high vs. low betrayal). Some events are not likely to evoke**

**working models (e.g., non-interpersonal events). Therefore, I predict that attachment will be related to change in outcomes only for interpersonal events. Other events may disrupt existing secure working models (e.g., ‘high betrayal events’ involving high intentional harm from a close other). Therefore, I predict that high betrayal events will not be followed by differential functioning based on attachment style, but differential functioning will be found for low betrayal events. That is, the effects of attachment are likely to be most pronounced for events that involve some ambiguity regarding intentional harm (i.e., events in which individual differences in working models are *most* likely to influence the appraisal process).**

Moderation analyses were conducted according to procedures outlined by Baron and Kenny (1986) and Frazier, Tix, and Barron (2004). Initially, events were to be coded as interpersonal or non-interpersonal. However, based on survey responses and lengthy discussion of the definition of “interpersonal trauma”, it was determined that an overwhelming majority of participants experienced interpersonal events, rendering statistical analysis of this moderation effect untenable. Thus, moderation analyses were conducted based on key elements of betrayal, using the responses from the Event Questionnaire (specifically, questions pertaining to the level of intentional harm associated with the event, the level of closeness to others involved). The closeness and intentional harm variables were entered into regression analyses as potential moderators (in separate analyses). Dependent variables included all 17 of those listed at the beginning of this appendix and utilized to test Hypothesis 1a. Because these analyses

involved running 17 separate regression analyses, the number of significant effects observed is only modestly above the number expected by chance.

Moderation analyses revealed a few effects for moderation. See the following Tables 1b-c for a summary of these significant moderation effects.

Table 1b

*Moderation Model for Attachment and Intentional Harm Predicting Partner Trust*

---

Predictor	Beta
Attachment Anxiety	-.11
Attachment Avoidance	-.03
Intentional Harm	.05
Anxiety*Avoidance	.13
Anxiety*Harm	-.04
Avoidance*Harm	.17*

*Note.* Sample N = 222. \*  $p < .05$

Values are standardized beta weights with both attachment subscales and their interaction entered in each model.

Table 1c

*Moderation Models for Attachment and Closeness Predicting Outcomes*

Predictor	MFS	SWLS	Binge Drinking
Attachment Anxiety	-.06	-.06	-.05
Attachment Avoidance	-.02	-.03	-.10
Closeness	-.27***	.04	-.02
Anxiety*Avoidance	.11	.03	-.06
Anxiety*Harm	-.22**	.02	-.18**
Avoidance*Harm	.01	.10*	.05

*Note.* Sample Ns = 222. \*  $p < .05$  \*\*  $p < .01$  \*\*\*  $p < .001$ .

Values are standardized beta weights with both attachment subscales and their interaction entered in each model. MFS = Murray's Felt Security Scale, SWLS = Satisfaction with Life Scale.

Given the lack of consistent effects across dependent variables, it was felt that these moderation effects were not likely to be informative about the nature of the relationship between event characteristics, attachment, and well-being. Most likely, these survey questions do not accurately capture the level of betrayal experienced by participants due to the wide variability in types of events examined in this study and multiple potential interpretations of the event questionnaire items. These analyses were not pursued further and will not be summarized further here.

**Hypothesis 1d: I predict that associations between attachment and *changes* in functioning will be moderated by trauma exposure. That is, whereas differential changes in well-being as a function of attachment style will be observed within the PTE group from Time 1 to Time 2, I anticipate that in the No PTE group these differential patterns of change will not be observed.**

A PTE/No PTE variable was created for all Time 2 participants (N = 789). Regression was used to test for moderation as outlined above (with the Trauma exposure variable included in the model). No moderation effects were found for outcomes of interest.

**Hypothesis 2a<sup>1</sup>: I predict that insecure attachment dimensions will relate to less coherent, meaningful, and emotionally-integrated narratives. Further, I predict that observed differences in narrative content and form at Time 2 will reflect differences between anxious and avoidant working models (e.g., more elaborated, ruminative narratives for anxious individuals and more terse, emotionally flat narratives for avoidant individuals).**

Narratives were coded for their level of coherence (see Appendix C), including indicators of cognitive processing, emotional expression, and meaning-making.

Narrative codes correlated with attachment. See the following Table 2a for a summary of these correlations. All components of narrative coherence were significantly or marginally correlated with T3 PTSD symptoms in the expected direction. Structure, orienting, and completeness all correlated with attachment anxiety. Structure, orienting and reflectiveness are all correlated with attachment avoidance, while completeness is

marginally related to attachment avoidance. Narrative components did not significantly correlate with residual scores for other outcomes.

Table 2a

*Correlations between Components of Coherence and Variables of Interest*

	Structure	Orienting	Completeness	Reflectiveness	Emotional Integration
Distress (BSI T1T3 residual)	-.10	-.01	.00	-.04	.03
PTSD Symptoms (PCL-S)	-.22**	-.14†	-.16*	-.16*	-.18*
Social Connectedness (SCS T1T3 residual)	.12	.05	.08	.08	.10
Loneliness (UCLALS T1T3 residual)	.03	-.01	.03	-.01	-.00
Aggression (STAB T1T3 residual)	-.12	.00	-.07	-.00	-.13†
Attachment Anxiety (AAQ)	-.25***	-.20**	-.15*	-.11	-.11
Attachment Avoidance (AAQ)	-.23**	-.23**	-.14†	-.21**	-.12

*Note.* Sample N = 177. †  $p < .10$  \*  $p < .05$  \*\*  $p < .01$  \*\*\*  $p < .001$ .

BSI = Brief symptom Inventory depression, anxiety, hostility subscales. PCL-S = PTSD

Checklist – Specific Version. SCS = Social Connectedness Scale. UCLALS = UCLA

Loneliness Scale. STAB = Subtypes of Antisocial Behavior Questionnaire. AAQ = Adult

Attachment Questionnaire anxiety and avoidance subscales.

**Hypothesis 2b: I predict that insecure attachment orientation will be associated with less favorable indices of social functioning (i.e., self-reported social support, disclosure, and effectiveness of telling narratives) post-trauma. I predict that observed differences in social support at time 2 will reflect differences between anxious and avoidant working models (e.g., less perceived social support for avoidant individuals, more disclosure for anxious individuals).**

Telling narrative codes were not found to correlate with adult attachment, and were omitted from further analyses. Thus, disclosure processes could not be examined. The hypothesized relations between attachment, social support variables, and outcomes were found in the data. See body of the dissertation for a description of these analyses.

**Hypothesis 3a: I predict that components of narratives (collected at time 2) will relate to psychological and physical well-being (at time 3) in a manner that is consistent with previous research.**

Bivariate correlations were performed with the narrative codes and all potential dependent variables (see Table 2a above). Relations between individual narrative codes and PTSD symptoms at Time 3 were significant, and in expected directions. Relations were not found between narrative codes and the residual score outcome variables.

**Hypothesis 3b: I predict that social functioning measured at time 2 will relate to psychological, physical, social, and relational well-being (at time 3) in a manner that is consistent with previous research.**

Relations between social support variables measured at time 2 and outcome variables at time 3 (i.e., psychological and social well-being) were found in expected directions. See the body of the dissertation for a review of these results.

**Hypothesis 4a: I predict that attachment anxiety and avoidance at time 1 will be associated with less favorable functioning at time 3.**

Predicted relations were found between attachment anxiety and avoidance and outcomes of interest (i.e., time 3 psychological and social well-being). See the body of the dissertation for a review of these results.

**Hypothesis 5: I predict that narrative quality and social support will mediate the observed relationships between insecure attachment and posttrauma adjustment.**

Tests of mediation were run using SEM, with comparisons between nested models and assessment of direct effects, as presented for the social support mediation analyses in the main body of the dissertation. Fit statistics are reported in the following Table 5a.

Model comparisons based on chi-square difference tests and CFI difference tests indicated that models with direct effects between attachment and outcomes better fit the data. See Table 5b for a summary of the path coefficients in these models (with direct effects). These results indicated that narrative coherence was not a significant mediator of the relationship between attachment and outcomes because the path from narrative coherence to outcomes was not significant in most models.

Table 5a

*Fit Statistics for Measurement and Structural Models for Narrative Mediation Analysis*

Models	df/ $\chi^2$	CFI	RMSEA/90%CI	SRMR
10. Measurement model	168/(240.96)***	.96	.05(.04, .06)	.05
11. Full mediation model for PTSD	73/(119.67)***	.97	.06(.04, .08)	.08
12. Full mediation model for BSI	73/(101.36)**	.98	.05(.02, .07)	.07
13. Full mediation model for STAB	61/(87.23)*	.98	.05(.02, .07)	.05
14. Partial mediation model (with direct paths) for PTSD	71/(107.10)***	.98	.05(.03, .07)	.05
15. Partial mediation model (with direct paths) for BSI	71/(87.09)*	.99	.04(.00, .06)	.04
16. Partial mediation model (with direct paths) for STAB	59/(85.24)*	.98	.05(.02, .07)	.04

Table 5b

*Tests of Mediated Effects – In Models with Direct Effects for Narrative Mediation Analysis*

Mediated effects	Standardized a	Unstandardized a (SE)	Standardized b	Unstandardized b (SE)	a*b
Attachment Anxiety					
Narratives –PTSD	-.20*	-.13(.06)	-.12	-.14(.09)	.02
Narratives –BSI	-.20*	-.12(.06)	.00	.00(.08)	.00
Narratives –STAB	-.20*	-.13(.06)	-.12	-.05(.04)	.02
Attachment Avoidance					
Narratives –PTSD	-.18*	-.10(.05)	-.12	-.14(.09)	.02
Narratives –BSI	-.17*	-.09(.05)	.00	.00(.08)	.00
Narratives –STAB	Partial -.18* Full -.18*	-.09(.05) -.09(.05)	-.12 -.15	-.05(.04) -.05(.05)	.02 .03

Because narrative coherence did, however, correlate with attachment and PTSD in expected directions, a more descriptive summary of relations between narrative codes and variables of interest within the data will be written as a separate manuscript.

See body of the dissertation for a summary of analyses pertaining to social support. Please note that relationship well-being variables were not included in any mediation analyses because of inadequate sample size ( $n = 94$ ).

## APPENDIX C

### Measures for Additional Analyses

Below I include descriptions of measures used to complete my proposed analyses (Appendix B), but not relevant to the analyses outlined in the body of the dissertation.

References cited within this appendix are included in the reference list above.

*SF-36 Health Survey.* The SF-36 Health Survey (Ware, Snow, Kosinski, & Gandek, 1993; see Ware & Kosinski, 2001) was used to assess for physical and mental functioning during the month preceding each assessment. The physical health and mental health summary scales were utilized separately to tap these distinct domains of functioning. The predictive validity of scores on this measure and their usefulness in discriminating between groups of patients suffering from a variety of mental and physical health ailments (e.g., McHorney, Ware & Raczek, 1993) have been well established. Norms for a variety of age groups have been developed, including 18-24 year olds (Jenkinson, Coulter, & Wright, 1993). In addition, the more brief, 12-item scale (the SF-12) has been found to be equivalent to the Physical Component Summary Score (PCS) and Mental Health Component Summary Score (MCS) of the SF-36 (Jenkinson et al., 1997); thus, the shorter subscale was used in this study to minimize participant burden. Reliability in this sample for the PCS was  $\alpha = .65$  and  $.69$  at T1 and T2, respectively, and for the MCS  $\alpha = .74$  and  $.78$  at T1 and T2, respectively.

*Life Satisfaction.* In order to include a positive measure of functioning, the five-item Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) was used to measure subjective well-being. Scale anchors were 1 = *Strongly disagree* and 7 =

*Strongly agree*. In the measure development sample, scores on this scale demonstrated a 2-month test–retest correlation coefficient of .82 and coefficient alpha of .87 (Diener et al., 1985). Internal consistency was higher in this sample ( $\alpha = .92$  at both T1 and T2).

*Smoking and Drinking Behavior*. Health behaviors (cigarette smoking, drinking) were assessed using two items each to assess frequencies of these behaviors at T1 and T2 (e.g., “During the past two weeks, how many days did you drink alcohol (smoke)?” and “On the days that you drank alcohol (smoked), about how many alcoholic beverages (cigarettes) did you consume (smoke)?”).

*Closeness*. For participants in a relationship, perceived closeness with their romantic partner was measured at T1 and T2 using the Inclusion-of-the-Other-in-the-Self Scale (IOS; Aron, Aron, & Smollan, 1992). The scale consists of a single-item, assessing closeness using seven Venn-like diagrams with overlapping circles. Increasing overlap between the circles signifies increasing levels of closeness. Participants select the level of overlap that matches their perception of the closeness in their romantic relationship. Scores on this scale have demonstrated good test-retest reliability and validity (see Aron et al., 1992).

*Partner Trust*. The Trust Scale (Rempel, Holmes, & Zanna, 1985) is a 17- item measure that assesses trust as a global relationship characteristic for participants’ current romantic relationship. It is composed of three subscales: faith, dependability, and predictability. Total scores on this scale have shown high reliability in undergraduate samples of dating couples (e.g.,  $\alpha = .85$  for women and  $\alpha = .88$  for men, Gable, Reis, Impett, & Asher, 2004). In this sample the internal consistency coefficient ( $\alpha$ ) was .89

and .92 at T1 and T2, respectively.

*Felt security.* The State Felt Security Scale (Murray, Bellavia, Rose, & Griffin, 2003) is composed of three subscales (of 6, 7, and 5 items, respectively) that assess felt rejection, felt acceptance, and anxiety about acceptance. Scores on these individual scales have shown very high internal consistency ( $\alpha = .90$ s) that decreases modestly when the scales are combined to form a composite score. The alpha coefficient in this sample for the composite score was .83 at T1 and T2.

*Partner responsiveness.* The Responsiveness Scale (Reis, 2003) is an 18-item measure designed to assess how much individuals feel understood, validated, and cared for by their romantic partners. Scores on this scale have displayed very high reliability in previous research with undergraduate samples (e.g., Gable, Gonzaga, & Strachman, 2006). Reliabilities in this sample were also good ( $\alpha = .97$  and  $.87$  at T1 and T2, respectively).

*Event Questionnaire.* Participants who experienced an interim PTE answered a single-item measure of intentional harm (“To what extent was someone intentionally trying to harm you?”; scale anchors 1 = *Not at all intentional* and 5 = *Completely intentional*). They also answered another single-item IOS measure with regard to the most central other person involved in the event (e.g., a perpetrator for an assault event, a former friend for a peer rejection event, a sick relative for a witnessing the illness of a close other event).

*Relationship Quality.* The Perceived Relationship Quality Components Scale (PRQC; Fletcher, Simpson, & Thomas, 2000) was used to assess relationship quality.

This 18-item scale measures six components of relationship quality: closeness, intimacy, passion, love, trust, and satisfaction. Scores on this scale have demonstrated very good reliability as well as predictive and convergent validity in college samples (e.g., Fletcher, Simpson, & Thomas, 2000). Reliabilities in this sample were very good ( $\alpha = .95$  and  $.96$  at T1 and T2, respectively).

*Narratives of worst interim events.* Participants who reported having experienced an interim trauma were asked to write a narrative with as many details of the event as they felt comfortable sharing. The instructions were as follows:

*Filling the next screen, please describe the event [computer prompt with the selected most distressing event] with as many details as you feel comfortable sharing. You might include what happened and who was involved. Your writing will remain confidential except if you provide information that we are required to report by law as stated in the consent form.*

Participants were also asked to write a narrative regarding the impact of the distressing event:

*Filling the next screen, please describe how the event [computer prompt with the selected most distressing event] has impacted you with as many details as you feel comfortable sharing. You might include your beliefs about why it happened, how it impacted you at the time, as well as how it affects you now. Your writing will remain confidential except if you provide information that we are required to report by law as stated in the consent form.*

*Narrative Coding*

Narrative codes were developed using a framework based in thematic analysis (Braun & Clarke, 2006) for identifying, analyzing, and reporting themes in narrative data. These authors emphasized the importance of several key decisions when developing a coding scheme, including 1) determining what ‘counts’ as a theme (i.e., how frequently observable a particular phenomenon must be to be coded as a theme), 2) whether the goal of the project is a rich description of the data set or a detailed account of one aspect of the data, 3) whether the analysis is geared toward an inductive or theoretical analysis of the themes, 4) whether themes are identified at the semantic or latent level, and 5) whether the analysis is conducted from an essentialist/realist perspective or a constructionist perspective. This analysis was conducted by acknowledging themes even if they only occurred in a minority of the data observations to provide a detailed account of the phenomena of coherence within this sample (1 and 2). Coding used a theoretically-derived process that was also responsive to unique features of this sample of narratives, or an “abductive” process of reasoning (3). Further, themes were identified at the latent level of analysis (4) and a *contextualist* perspective was used, situated between essentialist and constructivist perspectives (5).

Braun and Clarke (2006) suggested that thematic analysis proceed within six phases: 1) familiarizing yourself with the data, 2) generating initial codes, 3) searching for themes, 4) reviewing themes, 5) defining and naming themes, and 6) producing a report. In the current study, these phases of analysis took place across two larger stages of data collection and coding. In the first stage, a pilot sample ( $N = 26$ ) of worst lifetime trauma narratives from the larger study was used to provide data for preliminary code

development. Because these narratives were for worst lifetime events, rather than interim traumas, these narratives may differ in several respects from those that were ultimately included in the analyses. This pilot analysis was undertaken to allow coders to become familiar with trauma narratives generated by college students responding to our expanded checklist of traumatic events and to ascertain whether variability in coherence-related features of narratives could be observed in a sample similar to the final sample.

In the pilot stage, the coding team focused on phases 1 through 3 of the Braun and Clarke (2006) model. In the first phase, a team of six graduate and undergraduate students familiarized themselves with the data by reading and rereading the full sample of event descriptions. In the second phase, each member of the team independently generated extensive lists of observations of the data, thereby generating a large catalogue of initial codes. The team read literature detailing common components of narrative coherence, meaning-making and narratives of difficult events (e.g., Benish-Weisman, 2009; Fiese & Spagnola, 2005; McLean, 2005). With their new knowledge of the theoretical foundations of this coding endeavor, the coders returned to reread the narratives and expand upon the initial codes they had generated. In phase three, the team conducted a thorough discussion of initial codes, collating them into specific themes that were also present, in some form, in the literature (e.g., narrative structure, affective processing). Five themes were identified based on observations in the pilot sample (emotional balance, temporal structure, orienting, perspective, and meaning-making). A handful of codes were not collated under these themes (e.g., identifying with the event as something that made the narrator similar to others who had also experienced similar

events). These themes were excluded from further discussion because they were not related to the core objectives of the coding process (i.e., to provide a detailed account of coherence).

In the second stage of the coding process, to develop the final coding manual, two European-American, female graduate students from low to middle class backgrounds returned to phase one of the coding procedure. They reviewed coherence coding systems present in the literature, including several general models of narrative coherence (e.g., Fiese & Spagnola, 2005), particularly within the context of the trauma narrative and attachment literatures (Main & Goldwyn, 1996). Models of meaning-making were also reviewed (e.g., McLean, 2005). Then, they first read and reread the entire sample of 182 interim trauma narratives. Following that, they read and reread a randomly selected subsample ( $n = 36$ ) of the final sample of interim trauma narratives, stratified by attachment orientation (i.e., equal numbers of individuals with low, medium, and high scores on the two AAQ subscales were selected for coding). The coding sample was stratified to ensure that enough variability would be present. In phases two and three, coders' observations were discussed in relation to themes identified in the pilot stage.

Some differences between the pilot and final sample were observed. Meaning-making as it had been defined by pilot coders and within the literature was not clearly observable within the sample of interim trauma narratives, but nascent indications of meaning making were later incorporated into the code for the reflectiveness construct.

Based on convergence between observations from the data and existing coding schemes, the coders collated observations into a handful of key constructs. Ultimately,

five themes were identified by collating observations, differing slightly from those identified during the pilot stage, including emotional integration, structure, completeness, orienting, and reflectiveness.

Proceeding to phase four, the coders elaborated on the preliminary definitions of key constructs. In an iterative process, beginning with definitions based on those found in a review of the literature and expanding/adjusting to accommodate unique characteristics of these data, the coders refined descriptions of these constructs. For each construct in turn, both coders developed a preliminary definition, then rated all the narratives based on a three-point scale, to differentiate between narratives that were low, medium, or high on each construct. Following this, both coders discussed prominent exemplars of the construct in greater detail as well as any narratives where discrepancies in ratings were found. Definitions were further refined based on these discussions. This process of moving between rating each narrative and adjustment of narrative definitions was repeated until both coders had developed a rich, shared understanding of the material and the construct of interest and until reliability between coder's ratings was adequate. Special attention was also paid to differentiating constructs that initially had overlapping definitions (e.g., structure and completeness). Ultimately, the scale for each coding each construct was extended to a 1-5 scale to adequately account for the variability observed in the data.

In the final phase, definitions and exemplars from the coding sample were organized and reported in a coding manual, which was used to guide further quantitative coding of the full sample of interim trauma narratives. To further develop definitions for

these themes, the manual was shared with a team of experts who confirmed that the definitions were consistent with other conceptualizations of coherence within the literature. Based on discussions with this expert team, an additional code for emotional intensity was developed to augment the existing emotion integration construct. It was observed that documenting and differentiating both aspects of emotional expression would more fully capture the emotion processing present in the narratives. In developing the definition for this final construct, the coders returned to phase four and then five to refine its definition.

Using the coding manual, these two graduate student expert coders then rated the full sample of interim trauma narratives, with a 20% overlapping subsample to establish reliability. An additional reliability coder participated in the coding process, rating 30 narratives to ensure that reliability extended beyond those coders who developed the manual and to assess for coder drift. Alphas for the final codes were adequate (alphas for all three coders ranging from .79-.88 across constructs). Throughout all stages, coders were blind to the participants' attachment orientation and trauma history.

#### *Final Coding Definitions*

*Structure.* Structure was defined as the extent to which information in the narrative was organized and presented with a logical flow that reflected easily discernable causal and temporal relationships between components of the narrative. Some criteria for structure included a clear linear trajectory with a beginning, middle and end; a lack or repetitive or redundant information; and smooth transitions (i.e., without temporal leaps or gaps in the action of the story).

*Completeness.* Completeness was defined as the extent to which the narrative was concise, and met the reader's expectations for a complete yet parsimonious description of the event. Some criteria for this construct included all elements of the narrative related to the core event(s) being described, the narrative reflected the richness of lived experience, and all elements included in the narrative moved the story forward.

*Orienting.* Orienting was defined as the degree to which the narrative provided introductory information that oriented the reader to the content of the narrative and the general theme of the story. Criteria included broad orienting information and contextual/background details necessary to understanding, included in a manner that oriented the reader properly.

*Emotion Integration.* Emotion integration was defined as the degree to which the narrator was able to use emotional language to illustrate and articulate his or her emotional experience to the reader. Some criteria for this dimension of coherence were the use of specific emotional words (rather than vague or open-ended reference to emotion), the delineation of relationships between specific emotions and specific aspects of the event (rather than global emotional tone), and the extent to which emotional expressions were integrated with the information around them (rather than appearing out of the blue).

*Reflectiveness.* Reflectiveness was defined as the extent to which the narrative included markers of a reflective process (i.e., a process by which the event was understood from a larger perspective, including communication of a sense of meaning,

distance or perspective from the event; movement toward socially-valued action; and/or integration of the event into larger themes, meanings, and the broader narrative of self).

*Telling Narratives.* Individuals who experienced an interim PTE were asked to summarize an experience they vividly recalled involving telling someone about the event. They were given the following instructions.

*Filling the space below, please describe what happened when you told this person about your experiencing this event. What led you to tell about this memory? How did the person listening react to your story? What were your feelings and reactions before, during, and after the conversation? Please include any other details you can remember about telling this person about your event.*

In familiarizing ourselves with the data, coders observed that the telling narratives were brief and lacking in variability on key constructs (e.g., descriptions of feeling supported or emotionally validated). Therefore, a much abbreviated coding procedure was used to code the telling narratives. Two graduate students read and reread the telling narratives and then generated criteria for unusually positive, positive (most fell into this range), and negative telling experiences. Both coders rated a subsample ( $N = 36$ ) of the telling narratives to establish inter-rater reliability ( $ICC = .90$ ). A single coder then coded the remaining telling narratives.

## APPENDIX D

### Footnotes

<sup>i</sup>Because outcome variables were correlated, and there is potential for comorbidity to influence mediation analyses, a final omnibus test of the mediation model was conducted. Only PTSD and general psychological distress were examined because the other two outcomes of interest did not load highly enough onto a single factor to include them in the model. Thus, the omnibus model included the PCL-S and BSI subscales loading onto a single latent variable (see Figure 5). Fit statistics for this model were less favorable than those of other models ( $\chi^2 = 254.28, p < .001, RMSEA = .10, CFI = .88, SRMR = .08$ ), but all paths in the model were significant.