The Relationship between Adult Attachment Style and Post-traumatic Stress Symptoms: A Meta-Analysis

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Author note

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ABSTRACT

There is increasing evidence that adult attachment plays a role in the development and perseverance of symptoms of posttraumatic stress disorder (PTSD). This meta-analysis aims to synthesise this evidence and investigate the relationship between adult attachment styles and PTSD symptoms. A random-effects model was used to analyse 46 studies (N = 9268) across a wide range of traumas. Results revealed a medium association between secure attachment and lower PTSD symptoms ($\hat{\rho}$ = -.27), and a medium association, in the opposite direction, between insecure attachment and higher PTSD symptoms ($\hat{\rho}$ = .26). Attachment categories comprised of high levels of anxiety most strongly related to PTSD symptoms, with fearful attachment displaying the largest association ($\hat{\rho}$ = .44). Dismissing attachment was not significantly associated with PTSD symptoms. The relationship between insecure attachment and PTSD was moderated by type of PTSD measure (interview or questionnaire) and specific attachment category (e.g. secure, fearful). Results have theoretical and clinical significance.

Keywords: attachment, posttraumatic stress, trauma, social bonds, social cognition, meta-analysis

1.1 Introduction

Experiencing a traumatic event is necessary but not sufficient to explain the development of symptoms of posttraumatic stress disorder (PTSD) (American Psychiatric Association, 2013). Multiple factors have been associated with increased risk of PTSD such as a psychiatric history, familial psychiatric history, child abuse, trauma severity, lack of social support, additional life stress and dissociation during the event (Brewin, Andrews & Valentine, 2000; Ozer, Best, Lipsey & Weiss, 2003) . This paper considers the possible role of adult attachment in the development of PTSD symptoms.

The importance of social bonds and social cognition in response to traumatic events is increasingly recognised. Social bonds may potentially influence the development and maintenance of PTSD by affecting how an individual processes a traumatic event (Charuvastra & Cloitre, 2008). Various social-cognition models of PTSD have been proposed. Nietlisbach and Maercker (2009) suggest a reciprocal, interactive, concept of social cognition should be integrated into models of trauma processing. Sharp, Fonagy and Allen's (2012) model of PTSD outlines how social bonds and social cognition may contribute to the development of PTSD after a traumatic event. Within their model, social cognition (comprised of various social factors including social support, trust and social acknowledgment) is proposed to mediate the relationship between trauma and PTSD symptoms. Social cognition is founded on early caregiving experiences and attachment schemas; and it is proposed that people with insecure attachment patterns will have compromised mentalizing of trauma and therefore be more likely to develop PTSD symptoms (Fonagy & Allen, 2012).

Attachment style is formed in childhood through infant interactions with their primary caregiver. These interactions determine a child's immediate emotional responses to stress and emotion-regulation in later life (Bowlby, 1982). An infant's biologically-based attachment system monitors the proximity of attachment figures, and triggers a set of behaviours in the infant (e.g., crying) designed to increase proximity to the parent/caregiver (Bowlby, 1982). Following activation of this system – perhaps due to stress, fear or a need for sustenance – reliable, consistent, reassuring responses from the caregiver will lead to a 'secure' pattern of attachment behaviour in the infant. Unreliable, inconsistent or neglectful responses from the attachment figure will lead to 'insecurely' attached infants, exhibiting anxious and/or avoidant behavioural styles (Ainsworth, Blehar & Wall, 1978; Cassidy, 1999). Through these interactions, an infant develops an 'internal working model' of relationships (akin to a schema), which enables him/her to regulate, interpret and predict relationship behaviour throughout life (Mikulincer & Shaver, 2007). An adult's attachment style is therefore thought to be founded on the beliefs, expectations and feelings that they learnt as an infant with their caregiver.

Within the field of adult attachment, core concepts of the infant-caregiver relationship have been applied to adult-adult relationships. Most often romantic relationships are considered, although sometimes plutonic peer-peer adult relationships (e.g. Furman, 2001; Roisman, 2006). Research is guided by the underlying assumption that the relationship patterns and motivations within emotionally intimate adult relationships are the same as those observed in infancy. Fraley (2002) suggests that attachment theory offers a coherent and comprehensive explanation of why some adults appear secure and resilient within relationships, and others appear considerably more sensitive to relationship concerns. Hazan and Shaver (1987) found that the distribution of attachment style categories observed in adulthood is reflective of those

observed in infancy: with 56% secure, 24% avoidant, 20% anxious/ambivalent attachments. Adult attachment anxiety refers to a fear of abandonment by partners, an excessive need for approval, and distress at perceived rejection by partners. Attachment avoidance refers to a fear of dependence and intimacy, and an excessive need for self-reliance and avoidance of self-disclosure (Mikulincer, Shaver & Pereg, 2003). Secure adult attachment refers to the *absence* of attachment anxiety and avoidance, in that individuals' do not worry about being alone or being abandoned, and are comfortable with both being dependent on others and having others depend on them (Bartholomew & Horowitz, 1991). Although factor analysis of self-report measures has identified twelve different adult attachment styles, they map onto two higher-order dimensions of attachment anxiety and avoidance (Brennan, Clark and Shaver, 1998).

Various mechanisms of how attachment style relates to PTSD symptoms have been proposed. Dysfunctional hyper-activation or deactivation of emotion regulation strategies are believed to develop in an insecure infant-caregiver attachment relationship (Gerhardt, 2004). The inability to regulate emotions during and immediately after a traumatic event is therefore a potential mechanism through which attachment style may influence the development of PTSD symptoms (Kobak & Sceery, 1988). Similarly, a secure attachment style should result in greater ability to regulate emotions during a traumatic event and be associated with lower levels of PTSD symptoms. There is some evidence to support this hypothesis, showing that emotion regulation strategies mediate the association between secure attachment and lower levels of PTSD symptoms (Benoit, Bouthillier, Moss, Rousseau & Brunet, 2010).

The relationship between adult attachment styles and PTSD symptoms has been examined in many populations, including prisoners of war (Ein-dor, Doron, Mikulincer, Solomon & Shaver, 2010; Mikulincer, Ein-dor, Solomon & Shaver, 2011), veterans (Harari et al., 2009; Nye, Katzman, Bell, Kilpatrick et al., 2008), security workers (Bogaerts, 2009), those experiencing child abuse (Elklit, 2009; Sandberg, 2010), incest (Alexander, 1998), terrorist attacks (Fraley et al., 2006), childbirth (Iles, Slade & Spiby, 2011), and domestic violence (Scott & Babcock, 2010). Results suggest that secure attachment is associated with low PTSD symptoms (Alexander, 1993; Ghafoori, Hierholzer, Howsepian & Boardman, 2008; Ortigo, Westen, DeFife & Bradley, 2013), and insecure attachment is associated with higher PTSD symptoms (Clark & Owens, 2012; Scheidt et al., 2012; Solomon, Dekel & Mikulincer, 2008). However, a few studies do not find this (Elklit, 2009; Guðmundsdóttir, Guðmundsdóttir & Elklit, 2006) and publication bias may mean other null results have not been published. There is also debate over whether anxious or avoidant attachment styles most relate to PTSD symptoms, with some suggesting that avoidant attachment might protect against elevated levels of PTSD through use of defensive strategies and thought processes (Fraley et al., 2006). However, results are mixed, with some studies finding avoidant attachment more strongly associated with PTSD symptoms than anxious attachment (Frey et al., 2011).

Determining causality in the relationship between adult attachment and PTSD is difficult. Although it may be tempting to conclude that attachment style affects PTSD, research suggests that life events (traumatic or otherwise), or individual differences can change attachment patterns. For example, changing circumstances (Weinfield, Sroufe & Egeland, 2000) and individual characteristics such as defensive coping and perceived well-being (Zhang & Labouvie-Vief, 2004) are associated with changes in attachment style. There

is some suggestion that insecurely attached people may be particularly vulnerable to change: whereas secure individuals are likely to remain secure even in the face of difficult life events (Davila, Burge & Hammen, 1997). Given that traumatic events may be implicated in attachment style change, caution must be taken when attempting to determine a causal relationship between attachment and PTSD.

Despite an increasing number of studies considering the relationship between attachment and PTSD symptoms, results are mixed and often difficult to compare. Some factors have been found to mediate or moderate the relationship between adult attachment and PTSD, such as self-worth (Lim, Adams & Lilly, 2012), social support (Muller & Lemieux, 2000), coping strategies (Gore-Felton et al., 2012) and emotion regulation (Benoit et al, 2010). Ortigo, Westen, Defife and Bradley (2013) highlight the relative lack of empirical examination of the mechanisms linking attachment and PTSD. They propose that object relations (view of self and other) and social cognition should be examined due to their theoretical overlap with attachment, and their correlational study finds a mediating role for both. The current meta-analysis allows us to explore potential moderators of the relationship between attachment and PTSD symptoms.

Despite this growing literature and the potential relationship between attachment and PTSD there has been no previous meta-analytic review of the relationship. This meta-analysis of the relationship between attachment and PTSD symptoms is useful in determining an estimate of the strength of the population effect size, providing a much needed synthesis of the literature, and enabling us to examine the role of potential moderators. It also examines which attachment type (insecure/secure;

avoidant/anxious; fearful/preoccupied/dismissing) is most strongly associated with PTSD symptoms.

2.1 Method

2.1.1 Selection of studies for the meta-analysis

Database Searches. Combined search terms of *Attachment* AND (*PTSD* OR '*posttraumatic stress*' OR '*traumatic stress*') were searched for in five databases (Pubmed, Psych Info, Medline, Scopus and Web of Knowledge) in August 2013. Where possible, the narrowing criteria of human studies and English Language were applied. 2018 records were returned and transferred to Endnote, which identified 336 duplicates, leaving 1652 papers. Titles and abstracts of all papers were then reviewed, and obviously irrelevant papers (for example, those using a child population, animal studies, literature reviews and individual case reports) were excluded, leaving 101 papers eligible for full-paper review. The search process is shown in Figure 1.

Cited Measures. By searching through the 101 relevant papers returned in the above database searches, and through further consideration of two reviews of adult attachment measures (Crowell & Treboux, 1995; Ravitz, 2010), we located 30 adult attachment measures. Firstly, the original measure development papers for the 30 measures were located within the Web of Knowledge database. Secondly, all papers that referenced one or more of the 30 original measure development papers were located and considered for inclusion in this meta-analysis by searching for the terms *PTSD* OR '*posttraumatic stress*' OR '*traumatic stress*' within their title, abstract and keywords. Following this stage of the search procedure, 2 additional papers were found to be eligible for full paper review.

Review Papers. The database search returned no meta-analytic or systematic reviews of adult attachment style and PTSD. However, relevant review papers returned in the stage one search (Bakermans-Kranenburg et al., 2009; Cassidy & Mohr, 2001; Charuvastra & Clotre, 2008; Lima et al., 2010; Ravitz, 2010) were examined for empirical papers missed by database searches. No additional papers were found.

Unpublished Papers. Emails were sent to all contactable authors of papers returned in the database searches to request information on unpublished work. Where first author could not be located, the second author was contacted. Thirty-seven authors were emailed, and 59% replied (n = 22). Two relevant unpublished papers were returned.

Following all four stages of the search procedure, 105 papers were deemed eligible for full-paper consideration.

2.1.2 Inclusion and exclusion criteria

The 105 studies were assessed for eligibility using nine inclusion/exclusion criteria (see Figure 1). Papers were excluded if they were studies of children aged under 18 (k = 2); were not empirical research (k = 2); did not measure PTSD symptoms (k = 17) or adult attachment (k = 11), or only measured PTSD symptoms or adult attachment with a single item (k = 4); or did not report the relevant effect size (correlation coefficient, r), or enough data to calculate this. When this was the case, authors were contacted but if no further data were submitted papers were excluded (k = 20). Remaining criteria that did not result in papers being excluded were that studies had

to be quantitative and written in English. Treatment studies were only included if adult attachment style and PTSD symptoms were measured before treatment. Adult attachment had to be measured using secure and/or insecure categories/dimensions, compatible with the anxious and avoidant continuum/categories outlined by Bartholomew (1990).

Of the 105 full papers that were read, 56 were excluded based on the above inclusion and exclusion criteria, leaving 49 papers that reported results from 46 research studies for inclusion in the analysis. Where authors published results of one study in two papers, effect sizes were averaged between papers so the study was only entered once into analyses (Alexander 1993; Alexander et al., 1998); or the paper reporting less relevant or detailed information was excluded from analyses (Besser & Neria, 2010; Muller & Lemieux, 2000). In one case authors reported results for a questionnaire measure of attachment (Alexander 1993) or an interview measure of attachment (Alexander 1998) so effects from both these papers were included in moderator analyses of type of measure. Please note: papers included in the meta-analyses are marked with a * in the reference section.

2.1.3 Coding of Studies

From the 46 studies included in the analysis, various characteristics were identified as potential moderators of the relationship between attachment and PTSD symptoms: i) the type of event experienced, ii) time since the event[1], iii) mean age of participants,

[1] Where 'time since event' is not explicitly stated within the study, but event details are provided, the earliest possible date trauma could have been experienced was entered to enable analysis. For example, in the case of the Iraq war, the earliest possible date trauma could occur is the first day of the conflict – 20th March 2003.

iv) gender of participants (entered as a continuous variable based on percentage of males and females), v) marital status of participants (entered as a continuous variable based on percentage married or single), vi) ethnicity of participants (entered as a continuous variable based on percentage of Caucasian participants)[2], vii) type of sample (clinical vs community), viii) type of attachment measure (interview or questionnaire), ix) style of attachment measure (adult attachment measured categorically, or on a continuous *anxious* or *avoidant* scale), x) specific attachment category used (i.e. anxious, preoccupied etcetera) compared to a baseline of secure attachment, xi) posttraumatic stress measure type (interview or self-report), xii) study design (cross-sectional, longitudinal, controlled comparison or intervention), xiii) study quality (0 to 5).

Study quality was determined based on a rating scale modified from Mirza and Jenkins (2004). All 49 papers were assessed based on five criteria: i) explicitly stating study aims, ii) clear inclusion and exclusion criteria for participants, iii) using a validated measure of PTSD symptoms, iv) using a validated AAS measure, v) using statistical analysis appropriate to study aims and objectives. The studies were then given a total score of quality with the highest possible being five (1 = Yes, 0 = No). Individual study quality ranged from 3 to 5, with a grand mean of 4.10. Encouragingly, 28.57% (*n* = 14) scored 5. Table 1 reports each paper's quality score.

2.1.4 Attachment Categories

[2] Please note: we followed the gender/ethnicity/marriage catagorisation used by the majority of papers. Percentage (i.e. 69% Caucasian; 50% female) was primarily reported. As such, these sample characteristics lent themselves to being continuous (rather than categorical) moderators.

Seven attachment styles were drawn from the data supplied by each individual study, leading to seven separate meta-analyses. The use of these 'categories' was determined based: (i) on the categories supplied by the majority of papers and (ii) to ensure compatibility, the application of inclusion criteria that secure and/or insecure categories/dimensions should have been measured.

Firstly, examination of the possible papers indicated that papers within the field overwhelmingly use the continuums (anxious/avoidant) and categories (see below) outlined by Bartholomew (1990), with very few using other categories. Brennan, Clark and Shaver's (1998) factor analysis of all known self-report subscales supports this focus on the anxious/avoidant continuum and, although twelve difference constructs were located within the various measures, all constructs plotted onto the anxious and avoidant dimensions outlined by Bartholomew (1990). This model uses two dimensions (attachment anxiety and attachment avoidance) to determine whether people are high or low anxiety, and/or high or low avoidance. It can be used to produce four categories of adult attachment: secure (low anxiety, low avoidance), dismissing-avoidant (low anxiety, high avoidance), preoccupied (high anxiety, low avoidance), fearful-avoidant (high anxiety, high avoidance) (Bartholomew & Horowitz, 1991).

As well as being used to categorise each individual participant into a specific attachment style, the model can be used to produce a continuous score on the two scales (attachment anxiety and attachment avoidance). Rather than determining whether a participant is categorised as secure, dismissing, preoccupied or fearful, participants instead are given two continuous scores: anxious and avoidant.

Additionally though, the anxious and avoidant scores often lead to participant categorisation (as *either* anxious or avoidant). Further, the model can be used to determine whether someone is securely or insecurely attached – with all insecure categories (anxious, avoidant, dismissing, preoccupied, fearful) considered as one homogenous 'insecure' group based on the presence of attachment anxiety or avoidance. To be clear, not all papers in the meta-analysis used the Bartholomew *measure*, but papers did have to use the same *constructs* to be included in the meta-analysis.

Based on the above, the following seven attachment styles were used within the meta-analysis: secure, insecure, anxious, avoidant, dismissing, preoccupied, fearful. Table 1 (column 1) details each separate meta-analysis that data from individual studies contributed to. Studies tend to use *either* the anxious/avoidant constructs or the secure/dismissing/preoccupied/fearful constructs. The vast majority of studies (k = 45) were included within the overall insecure meta-analysis, with data drawn from all of the insecure attachment styles (anxious, avoidant, dismissing, preoccupied, fearful) or, where supplied, the papers own insecure attachment effect size (e.g. Bogaerts et al., 2008).

2.1.5 Computation and Analysis of Effect Size

Meta-analyses were conducted using the metafor package (Viechtbauer, 2010) for R (R Core Team, 2013). Pearson's correlation coefficient, r, was chosen as the effect size because, firstly, within our study sample r was the commonly reported effect size and, secondly, r is easily computable from chi-square, t, F and d (Hunter & Schmidt, 2004). Where attachment was measured categorically, correlation coefficients were

computed so that a positive coefficient represented a lower mean PTSD symptoms in the secure group than the insecure group(s), and a negative coefficient reflected a secure group with a higher level of PTSD symptoms than the insecure group(s). For continuous data, positive coefficients represented a lower level of PTSD symptoms, and negative coefficients represented a higher level of PTSD symptoms. Where studies reported multiple effect sizes for a given study question (e.g., several *r*s quantifying the association between avoidant attachment and PTSD symptoms), these effect sizes were aggregated within studies to insure that effect sizes in the meta-analysis were independent (Borenstein, Hedges, Higgins, & Rothstein, 2009; Cooper, 2010; Hunter & Schmidt, 2004).

As reported in Table 2, seven meta-analyses were conducted using the different attachment categories. All individual effect sizes from all studies were, firstly, determined to be either 'insecure and PTSD' or 'secure and PTSD'. Effect sizes from 45 of the 46 studies are included in the meta-analysis of insecure attachment on overall PTSD symptoms (Figure 2). The meta-analysis of insecure attachment on PTSD symptoms can be taken as the 'main effect' because it includes the vast majority of studies. Only one study (Benoit et al., 2010) reported *only* attachment security, and is therefore not included in the insecure main effect size. The effect size from Benoit et al. (2010) is instead included in the meta-analysis of secure attachment on PTSD symptoms, along with 10 other studies which also report secure attachment (Figure 3). Secondly, all effect sizes from the 45 studies reporting the relationship between insecure attachment and PTSD symptoms were, where explicitly stated, categorised as either anxious or avoidant attachment. Meta-analysis of anxious attachment on overall PTSD symptoms includes individual effect sizes from 28

studies. Meta-analysis of avoidant attachment on overall PTSD symptoms includes individual effect sizes from 26 studies. Thirdly, all insecure effect sizes were, where possible, further broken down into attachment sub-types fearful (Figure 4), dismissing and pre-occupied, and overall PTSD symptoms. For a full explanation of attachment categorisation, please see 2.1.4.

2.1.6 Method of Meta-analysis

Broadly speaking there are two conceptualisations of meta-analysis: the fixed-effects model (Hunter & Schmidt, 2004) and random effects model (Hedges & Vevea, 1998). There is a strong argument that the random-effects model is more appropriate for social science data (Field, 2005; Field & Gillett, 2010) because variability of effect size is the norm. Therefore, a random-effects model, using Hedges and Vevea's (1998) method and the DerSimonian-Laird estimator of heterogeneity (Dersimonian & Laird, 1986) was applied. Moderator analysis was also conducted using a random-effects general linear model (or 'meta-regression' as it is sometimes labelled), and all moderators were examined separately.

3.1 Results

3.1.1 Study Characteristics

Details of relevant study characteristics from individual studies are reported in Table 1. Within the 46 studies included in the meta-analysis, sample size of individual studies ranged from 31 to 561, with a total of 9268 participants. The majority of studies (k = 39) provided data on the mean (or median) age of participants, which ranged from 19 to 75.4, with a grand mean of 38.39. Of the 18 studies that reported

sample ethnicity, 16 used a predominantly Caucasian sample. Females were also over-represented within the studies, with 56% (k = 26) comprised of more than 50% females. Only 25 studies provided participant marital status, and the majority of these used a predominantly (>50%) married/co-habiting sample (k = 16). The majority of studies (k = 37, 80.43%) used a community rather than clinical sample.

A high proportion of studies (k = 17, 36.96%) used a military sample, with 10 studies examining the experience of combat and 7 the experience of war captivity. Nine studies used samples that had experienced various/mixed traumas[3] (19.56%), and 5 studies used samples whose primary traumatic event was either child sexual abuse (CSA) or child abuse (10.87%). Six studies examined participants who had experienced a 'terrorist attack' (13.04%), and 4 of physical violence/aggression (8.70%). The remaining 7 studies considered traumatic events not examined by other studies in the meta-analysis, for example, one study assessed participants who had experienced The Holocaust.

Only 26 studies (56.52%) reported the time that had elapsed since the event took place, or enough information about the event to calculate mean time since trauma. The length of time between the event and measurement of participant symptoms ranged from 1 month to over 50 years. Of the studies that supplied time since trauma data, 9 studies (34.62%) examined a sample that had experienced the traumatic event within the previous year. Two studies (7.69%) assessed a sample whose trauma had taken place between 1 and 5 years previous, 1 study (3.85%) between 10 and 20 years

[3] By various/mixed trauma we refer to papers that use a sample of participants who have experienced different traumatic events. For example, Benoit et al. (2010), who analyse a sample drawn from hospital admissions, with the majority of participants having experienced road accidents, but other having experienced accidents at work, burns or falls.

previous, 2 studies (7.69%) between 20 and 30 years previous, 8 studies between 30 and 40 years previous and 4 studies examined samples whose trauma had taken place over 50 years previous.

The majority of studies were cross-sectional (k = 27, 58.70%), with 9 controlled comparison (19.57%), 8 longitudinal (17.39%) and 2 interventions (4.35%). A wide range of adult attachment measures were used throughout the 46 studies, the majority of which measured adult attachment within adult romantic relationships; although some used composite measures that derived adult attachment from past family attachment patterns (e.g. the Adult Attachment Interview; George, Kaplan, & Main, 1985). The most widely used measures were the Adult Attachment Scale (AAS; Mikulincer et al., 1990) (k = 10, 21.74%) and the Relationship Questionnaire (RQ; Bartholomew & Horowitz, 1991) (k = 9, 19.57%). A wide range of PTSD measures were also used, with the majority using the PTSD Inventory (PTSD-I; Solomon, Neria, Ohry, Waysman et al., 1994) (k = 10, 21.74%). Measures used by individual studies are reported in Table 1.

3.1.2 Attachment and posttraumatic stress

Results of the meta-analyses for each of the seven attachment sub-types on PTSD symptoms are presented in Table 2. This table shows the number of studies included in each meta-analysis (k), the estimate of between study variability (τ^2), test of significance of between study variance (Q), the population effect size estimate ($\hat{\rho}$) and adjusted effect size estimate, and 95% Confidence intervals.

3.1.2.1 Insecure and secure attachment

The forest plot for insecure attachment (Figure 2) shows that mean effect sizes for individual studies ranged from $\hat{\rho}$ = -.36 (Guðmundsdóttir et al., 2006) to $\hat{\rho}$ = .91 (Currier et al., 2012). 91% of effect sizes lie between $\hat{\rho}$ = -.05 and $\hat{\rho}$ = .57 showing that both Guðmundsdóttir et al. (2006) and Currier et al. (2012) are exceptions in the strength of effect size compared to other studies. The overall population effect size was a modest $\hat{\rho}$ = .26 (Table 2).

The forest plot for secure attachment (Figure 3) shows mean effect sizes for individual studies ranging from $\hat{\rho}$ = –.10 (Declercq & Willemsen, 2006) to $\hat{\rho}$ = –.64 (Mikulincer et al., 1999). The overall population effect size was a modest $\hat{\rho}$ = –.27 (Table 2).

3.1.2.2 Anxious and avoidant attachment

Anxious attachment effect sizes ranged from $\hat{\rho}$ = -.36 (Guðmundsdóttir et al., 2006) to $\hat{\rho}$ = .59 (Cohen et al., 2011). The overall population effect size was a modest $\hat{\rho}$ = .26 (Table 2). For avoidant attachment effect sizes ranged from $\hat{\rho}$ = -.10 (Dekel et al., 2011) to $\hat{\rho}$ = .69 (Renaud, 2008). Multiple studies returned an effect size (or average effect size) of .0, meaning no or very little effect was detected. The overall population effect size was a modest $\hat{\rho}$ = .24 (Table 2).

3.1.2.3 Dismissing, fearful and preoccupied attachment

The forest plot for fearful attachment (Figure 4) shows that effect sizes ranged from $\hat{\rho}$ = -.05 (Alexander, 1993) to $\hat{\rho}$ = 1.07 (Currier et al., 2012). The population effect size estimate for fearful attachment was larger than for other attachment styles, $\hat{\rho}$ = .44

(Table 2). For preoccupied attachment effect sizes ranged from $\hat{\rho}$ = -.17 (Alexander, 1993) to $\hat{\rho}$ = .76 (Currier et al., 2012) with a population effect size estimate of $\hat{\rho}$ = .31 (Table 2). For dismissing attachment effect sizes ranged from $\hat{\rho}$ = -.14 (Alexander et al., 1998) to $\hat{\rho}$ = .84 (O'Connor & Elklit, 2008) with a non-significant population effect size of, $\hat{\rho}$ = .16 (Table 2).

3.1.3 Moderator Analysis

All homogeneity tests (τ^2, *Q)* indicated significant between-study variability in effect sizes ($p < .0005$, Table 2). Large variation in effect size can be seen within or between the insecure, avoidant, fearful and preoccupied meta-analyses. Although a small number of studies have supplied the outlying effect sizes, it is important to examine factors that moderate these relationships, as these results feed directly into the main 'insecure' meta-analysis. The vast majority of studies (k = 45) contributed to the overall effect size of insecure attachment and PTSD symptoms. As the largest of the meta-analyses, moderator analyses were performed on insecure attachment. Thirteen sample and study characteristics that may explain the significant variance of individual study effect size were examined separately to see if they moderated the relationship between insecure attachment and PTSD symptoms.

3.1.3.1 Sample characteristics

No sample characteristics were found to significantly moderate the relationship between insecure attachment and overall PTSD symptoms: gender (p = .495), marital status (p = .090), trauma type (p = .668), clinical or community sample (p = .978), and time since trauma greater or less than 10 years (p = .811) and ethnicity (p = .310).

3.1.2.2 Study characteristics

Categories of study design did not significantly moderate the relationship between insecure attachment and overall PTSD symptoms (p = .179). Importantly, study quality did not significantly predict strength of effect size (p = .751). Type of attachment measure (interview vs questionnaire) did not significantly moderate the relationship (p = .708). Attachment measure (adult attachment measured categorically, or on a continuous *anxious* or *avoidant* scale) did not significantly moderate the relationship, although the significance value is borderline (p = .083).

Type of PTSD measure was found to significantly moderate the relationship between insecure attachment and overall PTSD symptoms ($\chi 2$ (1) = 6.44, β = –.28, p = .0112), indicating that the mean effect size for each group was significantly different from their comparison group. Studies using self-report measures of PTSD symptoms, $\hat{\rho}$ = .28, demonstrate a stronger relationship between insecure attachment and PTSD symptoms than those using interview measures of PTSD, $\hat{\rho}$ = –.005. Of note though, only three studies used interview measures of PTSD.

3.1.3.3 Attachment categories as moderators

Using secure attachment style as baseline, specific attachment categories were found to significantly moderate the relationship between insecure attachment and overall PTSD symptoms ($\chi 2$ (6) = 74.21, p < .0001). Results reveal the relative strength of the relationship between each attachment category and PTSD symptoms, compared to the relationship between secure attachment and PTSD symptoms. Compared to secure attachment, fearful attachment demonstrated the strongest relationship (β = .73, p <

.0001), followed by the preoccupied attachment category (β =.59, p < .0001), and then the anxious attachment category (β = .54, p < .0001). The avoidant attachment category (β = .53, p < .0001) and the dismissing attachment category demonstrated the weakest relationship (β = .45, p < .0001). The insecure category itself was found to have a lower beta than the fearful, preoccupied and anxious categories (β = .47, p < .0001).

3.1.4 Publication Bias

Publication bias refers to the decision to publish a paper based on the results of that paper rather than basing the decision on the overall standard of research (Rosenthal, 1979). The biasing effect is seen when papers that report non-significant results are not published, whilst those with significant findings are. Publication bias can exert a substantial influence on meta-analytic reviews (Field & Gillett, 2010) given that published (rather than unpublished) results tend to be included in the synthesis.

To quantify the likely effect of publication bias, a sensitivity analysis based on Vevea and Woods (2005) was conducted which adjusts the population effect size estimate for moderate and severe one- and two-tailed selection bias. This was done using Vevea and Woods' (2005) scripts for S-plus adapted for R. Table 2 includes estimates of the population effect adjusted for severe two-tailed publication bias. Of course, all the adjusted values are smaller than the actual estimates reflecting the downward effect that publication bias has on the population effect size estimate. However, all adjusted effect sizes were broadly similar in size to the unadjusted values (in terms of the substantive size of effect). These results indicate that the broad conclusions drawn from the analysis are the same when correcting for publication bias.

4.1 Discussion

The meta-analyses found that secure attachment is associated with lower levels of PTSD symptoms following trauma, and insecure attachment is associated with higher levels of PTSD symptoms. These findings are consistent with results of individual studies (Alexander, 1993; Ghafoori, Hierholzer, Howsepian & Boardman, 2008; Scheidt et al., 2012; Solomon et al., 2008) and provide estimates of the overall strength of these associations. Insecure attachment sub-types (anxious/avoidant; fearful, preoccupied) were significantly associated with elevated PTSD symptoms but demonstrated fairly modest population effect size estimates. Dismissing attachment had a small, non-significant effect. Fearful attachment style was most strongly associated with PTSD symptoms. The relationship between insecure attachment and PTSD symptoms was significantly moderated by type of PTSD measure, with self-report measures demonstrating a stronger relationship with attachment than interview measures.

As expected, specific attachment category (using secure attachment as a baseline) significantly moderated the relationship between attachment style and PTSD symptoms. The relative importance of different types of insecure attachment is debated within the attachment literature; therefore, this finding and the results of the seven main meta-analyses highlight the importance of studying the different insecure attachment categories.

There is debate within the literature about the role of avoidance in the onset and perseverance of PTSD symptoms (for a summary see Fraley et al., 2006). This meta-

analysis found the population effect size for avoidant attachment on PTSD symptoms is modest ($\hat{\rho} = .24$), but nevertheless shows that an avoidant attachment style is associated with elevated levels of PTSD symptoms following trauma. Kobak and Sceery (1988) propose that each attachment style relates to distinct patterns of negative affect regulation, with avoidant individuals tending to cut-off from anger and distress, restricting acknowledgement of distress, negatively perceiving social support and expressing hostility within social relationships. All of which are likely to have a detrimental effect in the context of recovery from a traumatic event. Although our analyses examine the issue of underlying theoretical mechanisms, the results showed that in some circumstances avoidant attachment was associated with *lower* levels of PTSD symptoms: in particular that dismissing attachment category had only a small non-significant relationship with PTSD symptoms. This finding provides indirect support for the hypothesis that avoidance of threat-related cues, thoughts and feelings, combined with avoidance of attachment related worries, may be beneficial within the context of recovery from a traumatic event (Fraley, Davis & Shaver, 1998).

4.1.1 Limitations

Despite the rigour with which this meta-analysis was conducted, the results should be interpreted in the context of the following limitations. Firstly, moderator analysis was conducted only on the relationship between insecure attachment and PTSD symptoms. The analysis was structured to provide critical information whilst avoiding repetition. However, this is at the detriment of some finer detail on lower level insecure attachment categories. Furthermore, confirmation of the mechanisms underlying the relationship between attachment and PTSD symptoms could not be established by this meta-analysis for two reasons. First, although emotion-regulation (Benoit et al., 2010), self-worth (Lim, Adams & Lilly, 2012), self-esteem and

representations of others (Ortigo et al., 2013), social support (Muller & Lemieux, 2000) and coping strategies (Gore-Felton et al., 2012) have all been found to have mediating or moderating effects on the relationship, there were too few studies investigating these moderators to pool in the current analysis. Second, causality cannot be determined by pooling data that quantifies *associations* between attachment and PTSD symptoms. Although attachment theory is based on the assumption that that attachment style affects the development of PTSD because an individual's attachment style is determined at a young age, and should be relatively stable over time (Bowlby, 1982), the opposite causal hypothesis is theoretically plausible. In other words, the traumatic event, and even the symptoms themselves, may change attachment style (Weinfield, Sroufe & Egeland, 2000; Zhang & Labouvie-Vief, 2004). Indeed, adult attachment styles have been found to be labile in some studies (Baldwin & Fehr,1995; Davila, Burge & Hammen, 1997; Guðmundsdóttir, Guðmundsdóttir & Elklit, 2006). Until a greater number of longitudinal studies have been published the causal underpinnings of the relationship between attachment style and PTSD remains open.

Another potential limitation was the focus on *adult* attachment, which excludes valuable insights from research investigating the relationship in child populations. The adult inclusion criteria enabled us to provide a more focused analysis, however, by failing to include the child literature we are unable to comment on possible generalizations and similarities/differences between the two populations. This may have considerable theoretical and clinical benefit so should be examined in future. Finally, the poor reporting of effect sizes in papers included in the analyses led to incomplete data. For example, some papers might report the effect size for anxious

attachment and PTSD symptoms but not for avoidant attachment and PTSD symptoms. Unless studies routinely report effect sizes for all attachment categories, any meta-analysis will be based on only a subset of the relevant data.

4.1.2 Implications for Clinical Practice and Research

Results have significant implications for clinical practice and research. Within a clinical context, the finding that fearfully attached individuals are more likely to report PTSD symptoms than other attachment types may be important. Screening for, and addressing, fearful attachment prior to symptom treatment may improve treatment outcomes (Forbes et al., 2010). More widely, results highlight the importance of secure attachment, and therefore provide support for all work – clinical and research – aimed at promoting secure attachment styles.

Future research is needed to explore the issues raised by this meta-analysis in more detail. The medium effect sizes confirm a modest association between attachment style and PTSD symptoms. Although sample characteristics did not moderate these associations we only examined limited characteristics. As outlined in the introduction, many other individual and environmental factors have been shown to influence both PTSD and attachment style and these warrant further consideration. A focus on attachment alongside other aspects of social cognition and social bonds (for example, social support, social acknowledgement and disclosure) would help evaluate social cognitive models of PTSD (Charuvastra & Cloitre, 2008; Sharp et al., 2012), and improve our understanding of the relationship between social cognitive variables and PTSD.

Prospective studies of the moderating and mediating factors affecting the relationship are therefore needed. Likewise, despite some exceptional studies (for example, Elklit et al. 2009; Fraley et al., 2006; Iles et al., 2011; Mikulincer et al., 1999), it seems that both longitudinal *and* intervention studies are also lacking. Given the recent changes to PTSD diagnostic criteria (DSM V, American Psychiatric Association, 2013), it is also necessary to highlight the need for the relationship between adult attachment and PTSD to be considered using the updated measures that include the new negative cognitions and mood symptom cluster.

Finally, within the attachment literature there is increasing focus on the continuum model of anxious and avoidant attachment, over and above the use of categories. This is an empirically sound development and has been positive in terms of comparability and measure reliability. However, our results suggest there may be benefits to researcher's reporting the four attachment categories *as well as* the anxious/avoidant dimensions.

4.1.3 Summary and conclusion

This meta-analysis suggests that adult attachment style has a modest association with PTSD symptoms. This relationship appears to be found across many different types of traumatic event. It does not appear to be affected by the time that has elapsed since the trauma took place, type of event, gender or marital status, and various study characteristics. Secure attachment is associated with lower PTSD symptoms after a traumatic event, whereas insecure attachment is associated with increased symptoms. Results provide support for a renewed focus on the relationship between PTSD symptoms, social bonds, social cognition and attachment (Charuvastra & Cloitre,

2008; Nietlisbach & Maercker, 2009; Sharp et al., 2012). As Fraley et al. (2006) highlight, there are many ways for a person to be insecure, and it may be that examining sub-categories of insecure attachment will provide more insight or explanatory power. Results support previous research that finds anxious attachment (Mikulincer et al., 1993; Scott & Babcock, 2010) and sub-categories of anxious attachment (Muller, Sicoli & Lemieux, 2000) relate to PTSD symptoms over and above categories of avoidant attachment, and may therefore play a greater role in PTSD.

References

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.

*Alexander, P. C. (1993). The differential effects of abuse characteristics and attachment in the prediction of long-term effects of sexual abuse. *Journal of Interpersonal Violence, 8*(3), 346-362. doi: 10.1177/088626093008003004

*Alexander, P. C., Anderson, C. L., Brand, B., Schaeffer, C. M., Grelling, B. Z., & Kretz, L. (1998). Adult attachment and longterm effects in survivors of incest. *Child Abuse & Neglect, 22*(1), 45-61. doi: 10.1016/S0145-2134(97)00120-8

American Psychiatric Association, DSM-5 Task Force (2013). *Diagnostic and statistical manual of mental disorders: DSM-5*. Arlington, Va.: American Psychiatric Association.

Bakermans-Kranenburg, M. J. & Van IJzendoorn, M. H. (2009). The first 10,000 Adult Attachment Interviews: Distributions of adult attachment representations in non-clinical and clinical groups. *Attachment & Human Development, 11*, 223-263. doi: 10.1080/14616730902814762

Baldwin, M. & Fehr, B. (1995). On the instability of attachment style ratings. *Personal Relationships,* 2(3), 247-261. doi: 10.1111/j.1475-6811.1995.tb00090.x

Bartholomew, K. (1990). Avoidance of intimacy: An attachment perspective. *Journal of Social and Personal Relationships, 7*, 147-178. doi: 10.1177/0265407590072001

Bartholomew, K., & Horowitz, L. M. (1991). Attachment styles among young adults: A test of a four-category model. *Journal of Personality and Social Psychology, 61*, 226-244. doi: 10.1037/0022-3514.61.2.226

*Benoit, M., Bouthillier, D., Moss, E., Rousseau, C., & Brunet, A. (2010). Emotion regulation strategies as mediators of the association between level of attachment security and PTSD symptoms following trauma in adulthood. *Anxiety Stress and Coping, 23*(1), 101-118. doi: 10.1080/10615800802638279

*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*(3), 335-341. doi: 10.1016/j.jrp.2010.03.004

*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*(1), 34-46. doi: 10.1037/a0017835

*Besser, A., Neria, Y., & Haynes, M. (2009). Adult attachment, perceived stress, and PTSD among civilians exposed to ongoing terrorist attacks in Southern Israel. *Personality and Individual Differences, 47*(8), 851-857. doi: 10.1016/j.paid.2009.07.003

Blake, D.D., Weathers, F.W., Nagy, L.M., Kaloupek, D.G., Charney, D.S., & Keane, T.M. (1995). Development of a clinician administered PTSD scale. *Journal of Traumatic Stress*, *8*(1), 75-90. doi: 10.1002/jts.2490080106

*Boelen, P. A. (2012). A prospective examination of the association between the centrality of a loss and post-loss psychopathology. *Journal of Affective Disorders*, 137, 117-24. doi: 10.1016/j.jad.2011.12.004

*Bogaerts, S., Daalder, A. L., Van Der Knaap, L. M., Kunst, M. J. J. M., & Buschman, J. (2008). Critical incident, adult attachment style, and posttraumatic stress disorder: a comparison of three groups of security workers. *Social Behavior and Personality, 36*(8), 1063-1072. doi: 10.2224/sbp.2008.36.8.1063

*Bogaerts, S. S., Kunst, M. J. J. M. J., & Winkel, F. W. F. W. (2009). Dismissive attachment and posttraumatic stress disorder among securely and insecurely attached Belgian security workers. *Psychological Reports, 105* (3), 889-899. doi: 10.2466/PR0.105.3.889-899

Borenstein, M., Hedges, L. V., Higgins, J. P. T., & Rothstein, H. R. (2009). *Introduction to Meta Analysis*. Chichester: Wiley-Blackwell.

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

Brennan K. A., Clark C. L., 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*. New York: Guilford.

Brewin, C., 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*, 748-766. doi: 10.1037/0022-006X.68.5.748

Cassidy, J. (1999). The Nature of the Child's Ties. In J. Cassidy & P. R. Shaver (Eds), *Handbook of Attachment: Theory, Research and Clinical Applications*. New York, London: The Guildford Press.

Cassidy, J., & Mohr, J. J. (2001). Unsolvable fear, trauma, and psychopathology: Theory research, and clinical considerations related to disorganized attachment across the life span. *Clinical Psychology-Science and Practice, 8*(3), 275-298. doi: 10.1093/clipsy.8.3.275

Charuvastra, A. & Cloitre, M. (2008). Social bonds and posttraumatic stress disorder. *Annual Review of Psychology, 59,* 301-328. doi: 10.1146/annurev.psych.58.110405.085650

* Clark, A. A. & Owens, G. P. (2012). Attachment, personality characteristics, and posttraumatic stress disorder in U.S. veterans of Iraq and Afghanistan. *Journal of Traumatic Stress, 25,* 657-664. doi: 10.1002/jts.21760

*Cohen, E., Dekel, R., & Solomon, Z. (2002). Long-term adjustment and the role of attachment among Holocaust child survivors. *Personality and Individual Differences, 33*(2), 299-310. doi: 10.1016/S0191-8869(01)00156-8

*Cohen, E., Zerach, G., & Solomon, Z. (2011). The implication of combat-induced stress reaction, ptsd, and attachment in parenting among war veterans. *Journal of Family Psychology, 25*(5), 688-698. doi: 10.1037/a0024065

Cooper, H. M. (2010). *Research Synthesis and Meta-Analysis: A Step-by-Step Approach* (4th ed.). Thousand Oaks, CA: Sage.

Collins, N. (1996). Working models of attachment: Implications for explanation, emotion, and behavior. *Journal of Personality and Social Psychology, 71*, 810-832. doi: 10.1037/0022-3514.71.4.810

Collins, N. L. & Read, S. J. (1990). Adult attachment, working models, and relationship quality in dating couples. *Journal of Personality and Social Psychology, 58*, 644-663. doi: 10.1037/0022-3514.58.4.644

Crowell, J.A., Fraley, R.C., & Shaver, P. R. (1999). Measurement of Individual Differences in Adolescent and Adult Attachment. In J. Cassidy & P. R. Shaver (Eds) *Handbook of Attachment: Theory, Research and Clinical Applications*. New York, London: The Guildford Press.

Crowell, J.A. & Treboux, D. (1995). A review of adult attachment measures: Implications for theory and research. *Social Development, 4*, 294-327. doi: 10.1111/j.1467-9507.1995.tb00067.x

* Currier, J. M., Holland, J. M., & Allen, D. (2012). Attachment and mental health symptoms among U.S. Afghanistan and Iraq veterans seeking health care services. *Journal of Traumatic Stress, 25*, 633-640. doi: 10.1002/jts.21752

Davidson, J. R. T., Book, S. W., Colket, J. T., Tupler, L. A., Roth, S., David, D., Hertzberg, M., Mellman, T., Beckham, J. C., Smith, R. D., Davison, R. M., Katz, R., & Feldman, M. E. (1997) Assessment of a new self-rating scale for post-traumatic stress disorder. *Psychological Medicine, 27,* 153-160. doi: 10.1017/S0033291796004229

Davila, J., Burge, D. & Hammen, C. (1997). Why does attachment style change? *Journal of Personality and Social Psychology*, *73* (4), 826-838. doi: 10.1037/0022-3514.73.4.826

*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*(4), 256-263. doi: 10.1002/cpp.492

*Dekel, S., & Solomon, Z. (2011). Shared and Unique Predictors of Post-Traumatic Growth and Distress. *Journal of Clinical Psychology, 67*(3), 241-252. doi: 10.1002/jclp.20747

*Dekel, R., Solomon, Z., Ginzburg, K., & Neria, Y. (2004). Long-term adjustment among Israeli war veterans: The role of attachment style. *Anxiety Stress and Coping*, *17*(2), 141-152. doi: 10.1080/10615800410001721184

Dersimonian, R., & Laird, N. (1986). Meta-analysis in Clinical-Trials. *Controlled Clinical Trials, 7*(3), 177-188. doi:10.1016/0197-2456(86)90046-2

*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*(3), 374-378. doi: 10.1037/0002-9432.71.3.374

Ehlers, A. & Clark, D. M. (2000). A cognitive model of posttraumatic stress disorder. *Behaviour Research and Therapy*, 38, 319-345. doi: 10.1016/S0005-7967(99)00123-0

*Ein-Dor, T. T., Doron, G. G., Solomon, Z. Z., Mikulincer, M. M., & Shaver, P. R. P. R. (2010). Together in pain: attachment-related dyadic processes and posttraumatic stress disorder. *Journal of Counselling Psychology, 57*(3), 317-327. doi: 10.1037/a0019500

*Elklit, A. (2009). Traumatic stress and psychological adjustment in treatment-seeking women sexually abused in childhood: A follow-up. *Scandinavian Journal of Psychology, 50*(3), 251-257. doi: 10.1111/j.1467-9450.2008.00706.x

*Elwood, L. S., & Williams, N. L. (2007). PTSD-related cognitions and romantic attachment style as moderators of psychological symptoms in victims of interpersonal trauma. *Journal of Social and Clinical Psychology, 26*(10), 1189-1209. doi: 10.1521/jscp.2007.26.10.1189

Engelhard, I. M., Arntz, A., van den Hout, M. A., 2007. Low specificity of symptoms on the post-traumatic stress disorder (PTSD) symptom scale: A comparison of individuals with PTSD, individuals with other anxiety disorders and individuals without psychopathology. *British Journal of Clinical Psychology, 46*, 449-456. doi: 10.1348/014466507X206883

* Escolas, M. S., Arata-Maiers, R., Hildebrandt, E. J., Maiers, A. J., Mason, S. T., & Baker, M. T. (2012). The impact of attachment style on posttraumatic stress disorder symptoms in postdeployed military members. *U.S. Army Medical Department Journal, Jul-Sep,* 54-61.

Falsetti, S. A., Resnick, H. S., Resick, P. A., & Kilpatrick, D. G. (1993). The Modified PTSD Symptom Scale: A brief self-report measure of posttraumatic stress disorder. *The Behavior Therapist, 16*, 161-162.

Field, A. P. (2005). The problems in using fixed-effects models of meta-analysis on real-world data. *Understanding Statistics, 2*, 77-96. doi: 10.1207/S15328031US0202_02

Field, A. P. (2013). Meta-analysis in clinical psychology research. In J. S. Corner & P. C. Kendall (Eds.), *The Oxford Handbook of Clinical Psychology*. Oxford: Oxford University Press.

Field, A. P. and Gillett, R. (2010). How to do a meta-analysis. *British Journal of Mathematical and Statistical Psychology, 63*(3), 665-694. doi: 10.1348/000711010X502733

Foa, E. B. (1995). *Posttraumatic Stress Diagnostic Scale–manual*. Minneapolis, MN: National Computer Systems.

Foa, E. B., Riggs, D.S., Dancu, C.V., Rothbaum, B.O. (1993). Reliability and validity of a brief instrument for assessing posttraumatic stress disorder. *Journal of Traumatic Stress, 6*(4), 459-473. doi: 10.1002/jts.2490060405

*Forbes, D., Parslow, R., Fletcher, S., McHugh, T., & Creamer, M. (2010). Attachment style in the prediction of recovery following group treatment of combat veterans with post-traumatic stress disorder. *Journal of Nervous and Mental Disease, 198*(12), 881-884. doi: 10.1097/NMD.0b013e3181fe73fa

Fraley, R. C. (2002). Attachment stability from infancy to adulthood: Meta-analysis and dynamic modeling of development mechanisms. *Personality and Social Psychology Review, 6*, 123-151. doi: 10.1207/S15327957PSPR0602_03

*Fraley, R., Fazzari, D. A., Bonanno, G. A., & Dekel, S. (2006). Attachment and psychological adaptation in high exposure survivors of the September 11th attack on the World Trade Center. *Personality and Social Psychology Bulletin, 32*(4), 538-551. doi: 10.1177/0146167205282741

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*(2), 350-365. doi: 10.1037/0022-3514.78.2.350

*Frey, L. M., Blackburn, K. M., Werner-Wilson, R. J., Parker, T., & Wood, N. D. (2011). Posttraumatic stress disorder, attachment, and intimate partner violence in a military sample: A preliminary analysis. *Journal of Feminist Family Therapy*, *23*(3-4), 218-230. doi: 10.1080/08952833.2011.604530

Furman, W. (2001). Working Models of Friendships. *Journal of Social and Personal Relationship*, 18(5), 583-602. doi: 10.1177/0265407501185002

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

George**,** C**,** West**,** M**., &** Pettem**,** O**. (**1997). *The Adult Attachment Projective**,** Unpublished Attachment Measure and Coding Manual.* Mills College, Oakland, CA.

*Ghafoori, B., Hierholzer, R., Howsepian, B., & Boardman, A. (2008). The role of adult attachment, parental bonding, and spiritual love in the adjustment to military trauma. *Journal of Trauma and Dissociation, 9*(1), 85-106. doi: 10.1080/15299730802073726

*Gore-Felton, C., Ginzburg, K., Chartier, M., Gardner, W., Agnew-Blais, J., McGarvey, E., Weiss, E., Koopman, C. (2013). Attachment style and coping in relation to posttraumatic stress disorder symptoms among adults living with HIV/AIDS. *Journal of Behaviour Medicine, 36*(1), *51-60.* doi: 10.1007/s10865-012-9400-x

Griffin, D., Bartholomew, K. (1994). The metaphysics of measurement: The case of adult attachment. In K. Bartholomew & D. Perlman (Eds), *Attachment Processes in Adulthood. Advances in Personal Relationships, 5.* London: Jessica Kingsley.

* Guðmundsdóttir, H. S., Guðmundsdóttir, D. B., & Elklit, A. (2006). Risk and resistance factors for psychological distress in Icelandic parents of chronically ill children: An application of Wallander and Varni's disability-stress-coping model. *Journal of Clinical Psychology in Medical Settings, 13*(3), 299-306. doi: 10.1007/s10880-006-9025-8

*Harari, D., Bakermans-Kranenburg, M. J., de Kloet, C. S., Geuze, E., Vermetten, E., Westenberg, H. G. M., & van Ijzendoorn, M. H. (2009). Attachment representations in Dutch veterans with and without deployment-related PTSD. *Attachment & Human Development, 11*(6), 515-536. doi: 10.1080/14616730903282480

Hazan, C., & Shaver, P. R. (1987). Romantic love conceptualized as an attachment process. *Journal of Personality and Social Psychology*, 52, 511–524. doi: 10.1037/0022-3514.52.3.511

Hedges, L. V., & Vevea, J. L. (1998). Fixed-and random-effects models in meta-analysis. *Psychological Methods*, 3, 486-504. doi: 10.1037/1082-989X.3.4.486

Horowitz, M. J., Wilner, N. R. & Alvarez, W. **(**1979**)**. Impact of Event Scale: A measure of subjective stress. *Psychosomatic Medicine, 41,* 209 *-218.*

Hunter, J. E. & Schmidt, F. L. (2004). *Methods of Meta-Analysis: Correcting Error and Bias in Research Findings* (2nd ed.). Newbury Park, CA: Sage.

*Iles, J., Slade, P., & Spiby, H. (2011). Posttraumatic stress symptoms and postpartum depression in couples after childbirth: The role of partner support and attachment. *Journal of Anxiety Disorders, 25*(4), *520-530.* doi: 10.1016/j.janxdis.2010.12.006

Keane, T. M., Caddell, J. M., & Taylor, K. L. (1988). Mississippi Scale for combat related posttraumatic stress disorder: Three studies in reliability and validity. *Journal of Consulting and Clinical Psychology, 56,* 85-90. doi: 10.1037/0022-006X.56.1.85

Kobak, R. R., & Sceery, A. (1988). Attachment in late adolescence: working models, affect regulation, and representations of self and others. *Child Development*, 59, 135-146. doi: 10.2307/1130395

Lauterbach, D., &Vrana, S. (1996). Three studies on the reliability and validity of a self–report measure of posttraumatic stress disorder. *Assessment*, *3*, 17-25. doi: 10.1177/107319119600300102

*Lim, B. H., Adams, L. A., & Lilly, M. M. (2012). Self-worth as a mediator between attachment and posttraumatic stress in interpersonal trauma. *Journal of Interpersonal Violence*, 27(10), 2039-2061. doi: 10.1177/0886260511431440

Lima, A. R., Mello, M. F., & De Jesus Mari, J. The role of early parental bonding in the development of psychiatric symptoms in adulthood. *Current Opinion in Psychiatry*, *23*(4), 383-387. doi: 10.1097/YCO.0b013e32833a51ce

Main, M., Goldwyn, R., & Hesse, E. (2003). *Adult Attachment Scoring and Classification system*. Unpublished manuscript, University of California at Berkeley.

Main, M., Kaplan, N., & Cassidy, J. (1985). Security in infancy, childhood, and adulthood: A move to the level of representation. In I. Bretherton & E. Waters (Eds.), *Monographs of the Society for Research in Child Development, 50*(1-2), 66-104.

Main, M., & Solomon, J. (1990). Procedures for identifying infants as disorganized/disoriented during the Ainsworth Strange Situation. In M.T. Greenberg, D. Cicchetti, & E.M. Cummings (Eds.), *Attachment in the Preschool Years*. Chicago, UK: University of Chicago Press.

*Marmaras, E., Lee, S. S., Siegel, H., & Reich, W. (Writers). (2003). The Relationship Between Attachment Styles and Vicarious Traumatization in Female Trauma Therapists, *Journal of Prevention & Intervention in the Community, 26*(1), 81-92. doi: 10.1300/J005v26n01_07

*Mikulincer, M., Ein-Dor, T., Solomon, Z., & Shaver, P. R. (2011). Trajectories of attachment insecurities over a 17-year period: a latent growth curve analysis of the impact of war captivity and posttraumatic stress disorder. *Journal of Social and Clinical Psychology, 30*(9), 960-984. doi: 10.1521/jscp.2011.30.9.960

Mikulincer, M., Florian, V., & Tolmacz, R. (1990). Attachment styles and fear of personal death: a case study of affect regulation. *Journal of Personality and Social Psychology*, 58, 273–280. doi: 10.1037/0022-3514.58.2.273

*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*(5), 817-826. doi: 10.1037/0022-3514.64.5.817

*Mikulincer, M., Horesh, N., Eilati, I., & Kotler, M. (1999). The association between adult attachment style and mental health in extreme life-endangering conditions. *Personality and Individual Differences, 27*(5), 831-842. doi: 10.1016/S0191-8869(99)00032-X

Mikulincer, M., & Shaver, P. R. (2007). Boosting attachment security to promote mental health, prosocial values, and inter-group tolerance. *Psychological Inquiry, 18*(3), 139-156. doi: 10.1080/10478400701512646

Millon, T. (1994). *Millon Clinical Multiaxial Inventory-III manual.* Minneapolis, MN: National Computer Systems.

Mirza, R., & Jenkins, R. (2004). Risk factors, prevalence, and treatment of anxiety and depressive disorders in Pakistan: Systematic review. *British Medical Journal, 328,* 794−797. doi: 10.1136/bmj.328.7443.794

Mollica, R. F., Caspi-Yavin, Y., Bollimi, P., Truong, T., Tor, S. & Lavelle, J. (1992). Harvard Trauma Questionnaire. Validating a cross-cultural instrument for measuring torture, trauma, and posttraumatic stress disorder in Indo-Chinese refugees. *Journal of Nervous and Mental Disease, 180,* 111-116.

*Muller, R. T. L., & Lemieux , K. E. K. (2000). Social support, attachment, and psychopathology in high risk formerly maltreated adults. *Child Abuse & Neglect, 24*(7), 883-900. doi: 10.1016/S0145-2134(00)00150-2

*Muller, R. T. R., Sicoli, L. A. L., & Lemieux, K. E. K. (2000). Relationship between attachment style and posttraumatic stress symptomatology among adults who report the experience of childhood abuse. *Journal of Traumatic Stress, 13*(2), 321-332. doi: 10.1023/A:1007752719557

Nietlisbach, G. & Maercker, A. (2009). Social cognition and interpersonal impairments in trauma survivors with PTSD. *Journal of Aggression, Maltreatment & Trauma, 18*, 382-402. doi: 10.1080/10926770902881489

Nye, E., Katzman, J., Bell, J. B., Kilpatrick, J., Brainard, M., Haaland, K. Y. (2008). Attachment organization in Vietnam combat veterans with posttraumatic stress disorder. *Attachment & Human Development, 10*(1), 41-57. doi: 10.1080/14616730701868613

*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*(1), 59-71. doi: 10.1080/14616730701868597

*Ortigo, K. M., Westen, D., DeFife, J. A., Bradley, B. (2013). Attachment, social cognition, and posttraumatic stress symptoms in a traumatized, urban population: evidence for the mediating role of object relations. *Journal of Traumatic Stress, 26*(3), 361-368. doi: 10.1002/jts.21815

Ozer, E., Best, S., Lipsey, T.,Weiss, D. (2003). Predictors of posttraumatic stress disorder and symptoms in adults: a meta-analysis. *Psychological Bulletin*, 129, (1), 52–73. doi: 10.1037/0033-2909.129.1.52

Ravitz, P., Maunder, R., Hunter, J., Sthankiya, B., Lancee, W. (2010). Adult attachment measures: A 25-year review. *Journal of Psychosomatic Research, 69*(4), 419-432. doi: 10.1016/j.jpsychores.2009.08.006

R Core Team. (2013). R: A language and environment for statistical computing. Vienna, Austria: R Foundation for Statistical Computing. Retrieved from http://www.R-project.org

*Renaud, E. F. (2008). The attachment characteristics of combat veterans with PTSD. *Traumatology, 14*(3), 1-12. doi: 10.1177/1534765608319085

*Riggs, S. A., Paulson, A., Tunnell, E., Sahl, G., Atkison, H., & Ross, C. A. (2007). Attachment, personality, and psychopathology among adult inpatients: Self-reported romantic attachment style versus Adult Attachment Interview states of mind. *Development and Psychopathology, 19*(1), 263-291. doi: 10.1017/S0954579407070149

Roisman, G. I. (2006) The role of adult attachment security in non-romantic, non-attachment-related first interactions between same-sex strangers. *Attachment & Human Development*, 8(4), 341-352. doi: 10.1080/14616730601048217

Rosenthal, R. (1979). The file drawer problem and tolerance for null results. *Psychological Bulletin, 86*(3), 638-641. doi: 10.1037/0033-2909.86.3.638

*Sandberg, D. A. (2010). Adult Attachment as a Predictor of Posttraumatic Stress and Dissociation. *Journal of Trauma & Dissociation, 11*(3), 293-307. doi: 10.1080/15299731003780937

*Sandberg, D. A., Suess, E. A., & Heaton, J. L. (2010). Attachment anxiety as a mediator of the relationship between interpersonal trauma and posttraumatic symptomatology among college women. *Journal of Interpersonal Violence, 25*(1), 33-49. doi: 10.1177/0886260508329126

*Scheidt, C. E., Hasenburg, A., Kunze, M., Waller, E., Pfeifer, R., Zimmermann, P., Hartmann, A., Waller, N. (2012). Are individual differences of attachment predicting bereavement outcome after perinatal loss? A prospective cohort study. *Journal of Psychosomatic Research, 73*(5), 375-382. doi: 10.1016/j.jpsychores.2012.08.017

*Schiff, M., & Levit, S. (2010). Correlates of therapeutic alliance and treatment outcomes among Israeli female methadone patients. *Research on Social Work Practice, 20*(4), 380-390. doi: 10.1177/1049731509347854

Schwarzwald, J., Solomon, Z., Weisenberg, M., & Mikulincer, M. (1987). Validation of the Impact of Event Scale for psychological sequelae of combat. *Journal of Consulting and Clinical Psychology, 55*, 251-256. doi: 10.1037/0022-006X.55.2.251

*Scott, S., & Babcock, J. C. (2010). Attachment as a moderator between intimate partner violence and PTSD symptoms. *Journal of Family Violence, 25*(1), 1-9. doi: 10.1007/s10896-009-9264-1

Sharp, C., Fonagy, P., Allen, J. (2012). Posttraumatic Stress Disorder: A Social-cognitive perspective. *Clinical Psychology: Science and Practice, 19*(3), 229-240. doi: 10.1111/cpsp.12002

*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*(10), 1427-1434. doi: 10.1017/S0033291708002808

*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*(4), 271-285. doi: 10.1002/(SICI)1099-0984(199807/08)

Solomon, Z., Neria, Y., Ohry, A., Waysman, M., Ginzburg, K. (1994). PTSD among Israeli former prisoners of war and soldiers with combat stress reaction: a longitudinal study. *American Journal of Psychiatry* 151, 554–559.

Southwick, S., Morgan, A., Nagy, L., Bremner, D., Nicolaou, A., Johnson, D., Rosenheck, R., & Charney, D. (1993). Trauma-related symptoms in veterans of Operation Desert Storm: A preliminary report. *American Journal of Psychiatry, 150,* 1524-1528.

Steil, R. & Ehlers, A. (2000). Die Posttraumatische Diagnoseskala (PDS). Jena: Universität Jena, Psychologisches Institut.

Vevea, J. L., & Woods, C. M. (2005). Publication bias in research synthesis: Sensitivity analysis using a priori weight functions. *Psychological Methods, 10*(4), 428-443. doi: 10.1037/1082-989X.10.4.428

Viechtbauer, W. (2010). Conducting Meta-Analyses in R with the metafor Package. *Journal of Statistical Software, 36*(3), 1-48.

Waters, E., Merrick, S., Treboux, D., Crowell, J., & Albersheim, L. (2000). Attachment security in infancy and early adulthood: A twenty-year

longitudinal study. *Child Development, 71*, 684-689. doi: 10.1111/1467-8624.00176

Watson, C. G., Juba, M. P., Manifold, V., Kucala, T., & Anderson, P. E. D. (1991). The PTSD interview-rationale, description, reliability, and concurrent validity of a DSM III based technique. *Journal of Clinical Psychology*, 47(2), 179-188. doi: 10.1002/1097-4679(199103)

Weathers, F., Litz, B., Herman, D., Huska, J., & Keane, T. (1993). *The PTSD Checklist (PCL): Reliability, validity, and diagnostic utility*. Paper presented at the Annual Convention of the International Society for Traumatic Stress Studies, San Antonio, TX.

Wei, M., Russell, D. W., Mallinckrodt, B., & Vogel, D. L. (2007). The Experiences in Close Relationships Scale (ECR) - Short Form: Reliability, validity, and factor structure. *Journal of Personality Assessment, 88*, 187-204. doi: 10.1080/00223890701268041

Weinfield, N. S., Sroufe, A. L. & Egeland, B. (2000). Attachment from infancy to early adulthood in a high-risk sample: Continuity, discontinuity, and their correlates. *Child Development*, 71(3), 695-702. doi: 10.1111/1467-8624.00178

Weiss, D. S. & Marmar, C. R. **(**1997**)**. The Impact of Event Scale — Revised. In J. P. Wilson & T. M. Keane (Eds) *Assessing Psychological Trauma and PTSD.* New York: Guilford Press.

Westen, D. & Nakash, O. (2005). *Attachment Prototype Questionnaire manual*. Atlanta, GA: Emory University.

*Woodward, M. J., Patton, S. C., Olsen, S. A., Jones, J. M., Reich, C. M., Blackwell, N., Beck, J. G. (2013). How do attachment style and social support contribute to women's psychopathology following intimate partner violence? Examining clinician ratings versus self-report. *Journal of Anxiety Disorders, 27,* 312-320. doi: 10.1016/j.janxdis.2013.02.007

Zhang, F. & Labouvie-Vief, G. (2004). Stability and fluctuation in adult attachment style over a 6-year period. *Attachment & Human Development*, 6(4), 419-437. doi: 10.1080/1461673042000303127

*Zerach, G., & Greene, T., & Solomon, Z. (2014). Secondary traumatization and martial adjustment among former prisoners of war wives. *Journal of Loss and Trauma*. Advance online publication, Feb 25.

Table 1.
Characteristics of studies

Study	N	Trauma/event	Time since trauma	Mean age	Sex	Relationship composition	Ethnicity	Attachment measure *interview	PTSS measure *interview	Study design	Study quality
Alexander (1993) [a] Sec, Insec, Dismiss, Fear, Preocc	112	Child sexual abuse (incest)	30.4 years (*M*)	37	100% female		85% Caucasian	RQ (Bartholomew & Horowitz, 1991)	IES (Horowitz et al., 1979)	C.S.	3
Alexander et al., (1998) [a] Insec, Dismiss, Fear, Preocc	92	Child sexual abuse (incest)	30.4 years (*M*)	37	100% female		85% Caucasian	FA Interview* (Bartholomew & Horowitz, 1991)	IES (Horowitz et al., 1979)	C.S.	4
Benoit et al., (2010) Sec	36	Various (hospital emergency admissions)	4 - 12 weeks	33	44.4% female	61% married/cohabiting		AAP Interview* (George et al., 1997)	IES-R (Weiss & Marmar, 1997)	L.	5
Besser & Neria (2010) [b]	135	Missile fire	4 months	23.85	84% female			ECR-R (Fraley et al., 2000)	PTSD-I (Solomon et al., 1994)	L.	4
Besser & Neria (2012) Insec, Anx, Avoid	135	Missile fire	Ongoing	23.85	84% female			ECR-R (Fraley et al., 2000)	PTSD-I (Solomon et al., 1994)	C.S.	4
Besser et al.,	562	Missile fire	Ongoin	33.68	53.6%			ECR-R (Fraley et	IES-R (Weiss	C.C.	5

(2009) Insec, Anx, Avoid			g (< 7 years)		female			al., 2000)	& Marmar, 1997)		
Boelen (2012) Insec, Anx, Avoid	176	Bereaved	4.8 months (*M*)	45	87.5% female			RQ (Bartholomew & Horowitz, 1991)	PSS-SR (Foa et al., 1993; Engelhard et al., 2007)	L.	4
Bogaerts et al., (2009) Insec	79	Physical violence / aggression	< 1 year	42.2	100% male	53% married		RQ (Bartholomew & Horowitz, 1991)	DTS (Davidson et al., 1997)	C.S.	3
Bogaerts et al., (2008) Insec	212	Physical violence / aggression	< 6 months	42.2	100% male	53% married		RQ (Bartholomew & Horowitz, 1991)	DTS (Davidson et al., 1997)	C.C.	4
Clark & Owens (2012) Insec, Anx, Avoid	116	Combat	Ongoing – 12 years	35	81% male		88% Caucasian	ECR-S (Wei et al, 2007)	PCL-M (Weathers et al., 1993)	C.S.	4
Cohen et al., (2002) Insec, Avoid	134	Holocaust	>50 years	60	54% female	85% married		AASQ (Mikulincer et al., 1990)	PTSD-I (Solomon et al., 1994); IES (Horowitz et al., 1979)	C.C.	4
Cohen et al., (2011) Insec, Anx, Avoid	477	Combat	2 – 28 years	47.3	100% male	96.5% married		ECR (Brennan et al., 1998)	PTSD-I (Solomon et al., 1994)	C.C.	4

Currier et al., (2012) Insec, Fear, Preocc	157	Combat	1.8 - 11 years	35.9	91.4% male	49% married	61.6% Caucasian	ECR-R (Fraley et al., 2000)	PCL-C (Weathers et al., 1993)	C.S.	4
Declercq & Willemsen (2006) Sec, Insec, Dismiss, Fear, Preocc	544	Various (high risk civilian sample)		41	84% male			RQ (Bartholomew & Horowitz, 1991)	DTS (Davidson et al., 1997)	C.S.	4
Dekel et al., (2004) Insec, Anx, Avoid	399	Combat	31 years			41% married		AASQ (Mikulincer et al., 1990)	PTSD-I (Solomon et al., 1994)	C.C.	4
Dekel et al., (2011) Insec, Anx, Avoid	103	War captivity	30 years					AASQ (Mikulincer et al., 1990)	PTSD-I (Solomon et al., 1994)	L	4
Dieperink et al., (2001) Insec	107	War captivity	>50 years	75.4		84% married		RQ (Bartholomew & Horowitz, 1991)	PCL-M (Weathers et al., 1993)	C.S.	4
Ein-Dor et al., (2010) Insec, Anx, Avoid	314	War captivity	37 years	53.37	50% female	100% married/cohabiting		AASQ (Mikulincer et al., 1990)	PTSD-I (Solomon et al., 1994)	C.C.	4
Elklit (2009) Insec, Anx, Avoid	69	Child sexual abuse	26.7 years (*M*)	33.3	100% female	50% married/cohabiting	100% Caucasian	RAAS (Collins & Read, 1990; Collins, 1996)	HTQ (Mollica et al., 1992)	I.	4
Elwood et al., (2007) Insec, Anx, Avoid	287	Interpersonal trauma		20.18	76% female		89% Caucasian	ECR (Brennan et al., 1998)	PPTS-R (Lauterbach & Vrana, 1996)	C.S.	4
Escolas et al., (2012) Insec, Dismiss,	561	Combat	1 month – 14 years		71.8% male	69% married/cohabiting	65.6% Caucasian	RQ (Bartholomew & Horowitz,	PCL-M (Weathers et al., 1993)	C.S.	5

Fear, Preocc								1991); ECR-R (Fraley et al., 2000)			
Forbes et al., (2010) Sec, Insec, Dismiss, Fear, Preocc	103	Combat	35 – 54 years	53.3	100% male			RSQ (Griffin & Bartholomew, 1994)	PCL-M (Weathers et al., 1993)	I.	3
Fraley et al., (2006) Insec, Anx, Avoid	45	Sept. 11th, attack on WTC in U.S.A.	7 months – 18 months	39			84.4% Caucasian	RSQ (Griffin & Bartholomew, 1994)	PSS-SR (Foa et al., 1993)	L.	4
Frey et al., (2011) Insec, Anx, Avoid	40	Combat		28.5	50% female	100% married	75% Caucasian	ECR (Brennan et al., 1998)	PCL-M (Weathers et al., 1993)	C.S.	4
Ghafoori et al., (2008) Sec, Insec	102	Combat	33 – 52 years (86%)	56		52% married/cohabiting	58% Caucasian	RSQ (Griffin & Bartholomew, 1994); ECR-R (Fraley et al., 2000)	CAPS (Blake et al., 1998)*	C.S.	5
Gore-Felton et al., (2013) Sec, Insec, Anx, Avoid	94	Various (HIV/AIDS sample)		39.7	62.8% female	46.8% single	52% Caucasian	Three-category measure (Hazan & Shaver, 1987)	PCL-C (Weathers et al., 1993)	C.S.	5
Guðmundsdóttir et al., (2006) Insec, Anx	105	Terminal illness (parents of child)		35.7	63% female			RAAS (Collins & Read, 1990; Collins, 1996)	HTQ (Mollica et al., 1992)	C.S.	4
Harari et al. (2009)	60	Combat		34.6				AAI (Main et	CAPS (Blake	C.C.	4

Insec								al, 2003)*	et al., 1998)*		
Iles et al. (2011) Insec, Anx, Avoid	372	Birth	7 weeks – 3 months	33	50% female	100% married/cohabiting		ECR-R (Fraley et al., 2000)	PTSD-Q (Watson et al., 1991)	L.	5
Lim et al. (2012) Insec, Anx, Avoid	228	Various (interp. vs non-interp.)		19.64	66.7% female		68.9% Caucasian	ECR-R (Fraley et al., 2000)	PDS (Foa et al., 1995)	C.S.	4
Marmaras et al. (2003) Sec, Insec, Dismiss, Fear, Preocc	375	Vicarious Traumatization (trauma therapists)			100% female		93.6% Caucasian	RQ (Bartholomew & Horowitz, 1991)	IES-R (Weiss & Marmar, 1997)	C.S.	4
Mikulincer et al. (2011) Insec, Anx, Avoid	321	War captivity	18 – 35 years	57				AASQ (Mikulincer et al., 1990)	PTSD-I (Solomon et al., 1994)	L.	4
Mikulincer et al. (1993) Insec, Anx, Avoid	140	Missile fire	2 weeks		68.6% female			AASQ (Mikulincer et al., 1990)	IES (Horowitz et al., 1979; Schwarzwald et al, 1987)	C.S.	3
Mikulincer et al. (1999) Sec, Insec, Anx, Avoid	80	'Terrorist' attacks		30 (*Mdn*)	60% female	61% married		AASQ (Mikulincer et al., 1990)	PTSD-I (Solomon et al., 1994); IES (Horowitz et al., 1979; Schwarzwald et al, 1987)	C.C.	4
Muller & Lemieux (2000a) [b]	66	Child abuse		33	63.6% female		61% Caucasian	RSQ (Griffin & Bartholomew, 1994)	PTSD-C (Southwick et al., 1993)	C.S.	5

Muller et al. (2000b) Insec, Dismiss, Fear, Preocc	66	Child abuse		33	63.6% female	62% single	61% Caucasian	RSQ (Griffin & Bartholomew, 1994)	PTSD-C (Southwick et al., 1993)	C.S.	5
O'Connor & Elklit (2008) Insec, Dismiss, Fear, Preocc	328	Various (student sample)		29.2	65% female	48% single		RAAS (Collins & Read, 1990; Collins, 1996)	HTQ (Mollica et al., 1992)	C.S.	4
Ortigo et al (2013) Sec, Insec, Dismiss, Preocc	263	Various (hospital admissions)						AAPQ (Westen & Nakash, 2005)	PSS (Falsetti et al., 1993)	C.S.	4
Renaud (2008) Insec, Anx, Avoid	49	Combat	33-52 years (81.6%)	57.4	100% male	55.1% married		Three-category measure (Hazan & Shaver, 1987); ECR (Brennan et al., 1998)	Mississippi Scale (Keane et al., 1988)	C.S.	4
Riggs et al. (2007) Insec, Anx, Avoid	80	Child abuse		36.56	92.5% female	38.8% married	81.3% Caucasian	ECR (Brennan et al., 1998)	MCMI-III (Million, 1994)	C.S.	5
Sandberg (2010a) Sec, Insec, Dismiss, Fear, Preocc	199	Various (child & adolescent abuse		19 (*Mdn*)	100% female	85% single	30% Caucasian	RQ (Bartholomew & Horowitz, 1991)	PCL-C (Weathers et al., 1993)	C.S.	3
Sandberg et al. (2010b) Insec, Anx, Avoid	224	Various (college sample)		21.73	100% female	79% single	30% Caucasian	ECR (Brennan et al., 1998)	PCL-C (Weathers et al., 1993)	C.S.	4
Scheidt et al. (2012) Sec, Insec,	31	Perinatal loss	4 weeks – 9 months	35.19	100% female	74.2% married		AAI (Main et al, 2003)*	PDS (Foa et al., 1995; Steil et al., 2000)	L.	5

Dismiss, Preocc											
Schiff & Levit (2010) Insec, Anx, Avoid	95	Various (methadone patients)		39.35	100% female			ECR (Brennan et al., 1998; Mikulincer, 1998)	PDS (Foa et al., 1995)	C.S.	4
Scott & Babcock (2010) Insec, Anx	174	Intimate partner violence		30.11	100% female			AAS (Collins & Read, 1990)	PDS (Foa et al., 1995)	C.S.	5
Solomon et al. (2008) Insec, Anx, Avoid	209	War captivity	18 years - 30 years					AASQ (Mikulincer et al., 1990)	PTSD-I (Solomon et al., 1994)	L.	5
Solomon et al. (1998) Insec, Anx, Avoid	348	War captivity	18 years	40 (M)		26% married		AASQ (Mikulincer et al., 1990)	IES (Horowitz et al., 1979); PTSD-I (Solomon et al., 1994)	C.C.	5
Woodward et al. (2013) Insec, Anx	108	Intimate partner violence		36.6	100% female		56.5% Caucasian	RAAS (Collins & Read, 1990; Collins, 1996)	CAPS (Blake et al., 1995)*	C.S.	5
Zerach et al. (2014) Insec, Anx, Avoid	156	Secondary traumatization (wives of former POWs)		57.9	100% female	100% married		AASQ (Mikulincer et al., 1990)	PTSD-I (Solomon et al., 1994)	C.S	N/A

Note: All studies included in the meta-analysis are marked with * in the reference section. Column 1 includes detail of each separate meta-analysis (Secure, Insecure, Anxious, Avoidant, Dismissing, Fearful, Preoccupied) that data from the study contributed to. Study design abbreviations are Cross Sectional (C.S.), Longitudinal (L.), Controlled Comparison (C.C.) and Intervention (I.)

[a] These papers report results from the same study so effect sizes were averaged for the main analyses.

[b] Results from these papers were excluded from analyses because findings are reported in another paper already included in analyses.

Table 2

Individual meta-analyses of attachment type on overall PTSD symptoms

Attachment type	*k*	τ^2	*Q*	$\hat{\rho}$	*Adjusted* $\hat{\rho}$	95% Confidence intervals	
						Lower	Upper
Insecure	44	0.033	272.70***	.259***	.218	.198	.320
Secure	11	0.013	31.19**	–.269***	–.244	-.357	-.181
Anxious	28	0.033	171.27***	.257***	.218	.180	.333
Avoidant	26	0.024	123.42***	.243***	.210	.174	.313
Dismissing	10	0.072	139.99***	.163	.135	–.016	.342
Fearful	9	0.068	122.77***	.444***	.394	.264	.624
Preoccupied	11	0.027	60.97***	.307***	.276	.193	.421

Figure 1. Systematic search flow diagram

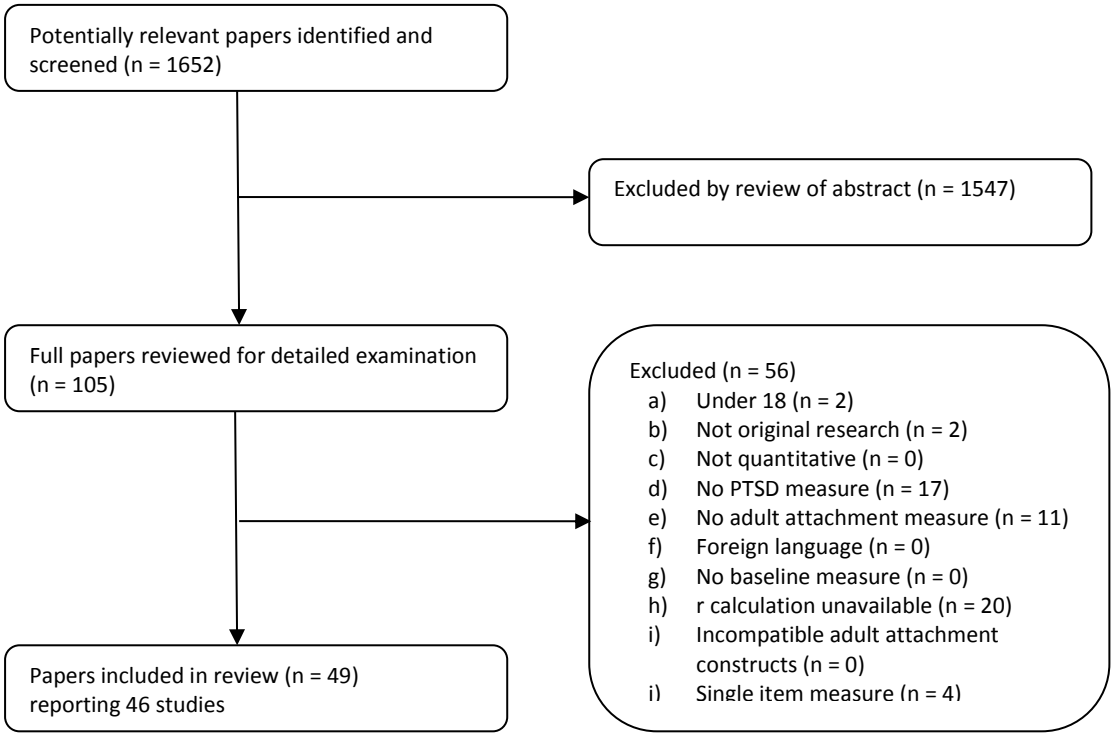

Figure 2. Forest plot of studies reporting the relationship between *insecure* attachment and PTSD symptoms: overall effect size, their confidence interval and the range of effect sizes within each individual study are reported.

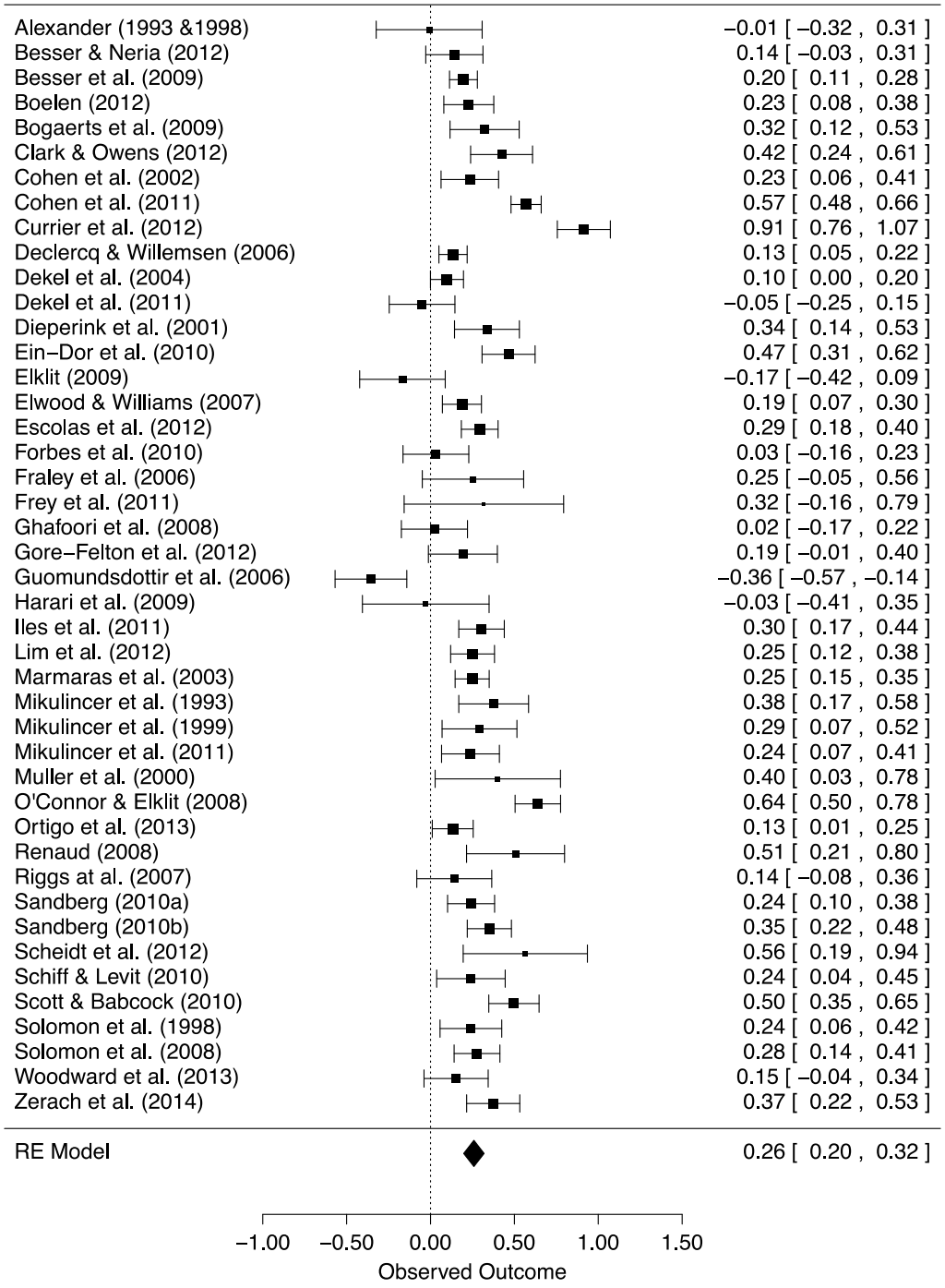

Figure 3. Forest plot of studies reporting the relationship between *secure* attachment and PTSD symptoms: overall effect size, their confidence interval and the range of effect sizes within each individual study are reported

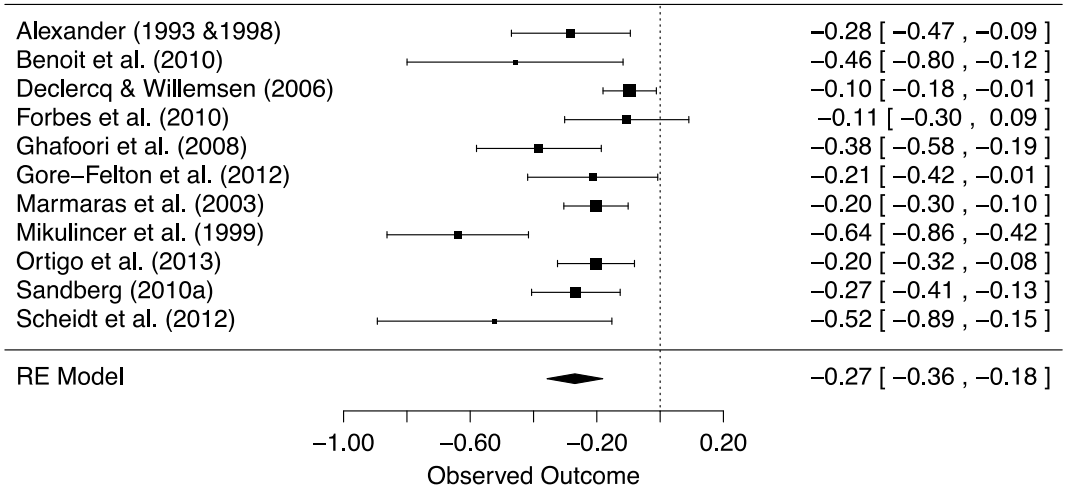

Figure 4. Forest plot of studies reporting the relationship between *fearful* attachment and PTSD symptoms: overall effect size, their confidence interval and the range of effect sizes within each individual study are reported