

ADULT ATTACHMENT STYLES AS PREDICTORS OF POSTTRAUMATIC
STRESS SEVERITY AND PTSD AMONG U.S. ARMY SOLDIERS

A DISSERTATION

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BY

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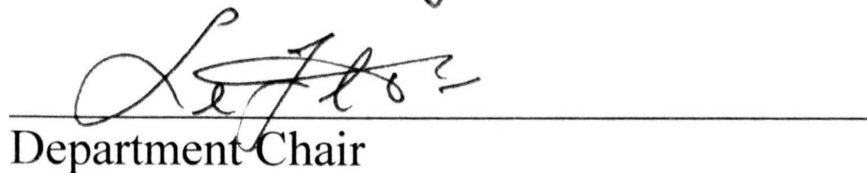
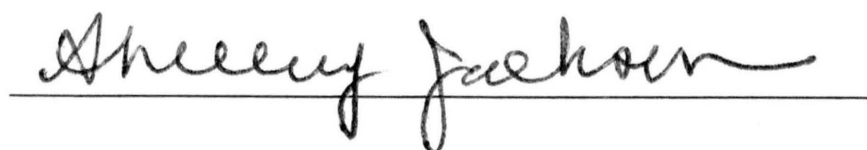
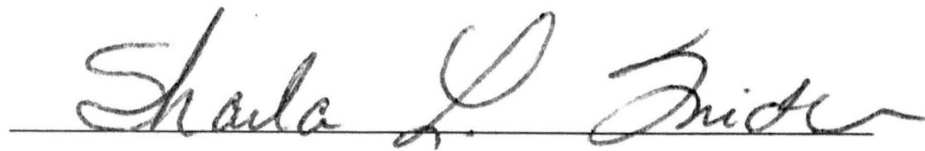
To the Dean of the Graduate School:

I am submitting herewith a dissertation written by Robert Holden Williams entitled "Adult Attachment Styles as Predictors of Posttraumatic Stress Severity and PTSD Among U.S. Army Soldiers." I have examined this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy with a major in Family Studies.



Larry LeFlore, Ph.D., Major Professor

We have read this dissertation and recommend its acceptance:



Department Chair

Accepted:



Dean of the Graduate School

DEDICATION

To my father, Fred J. Williams Jr. (1918-1991),
Army medic in World War II,
(Normandy, Northern France, Rhineland, Ardennes, Central Europe)
In remembrance of your service and love.

To my mother, Susie H. Williams,
Thank you for your consistent and abiding love and support.

To my wife, Becky M. Williams,
Thank you for being a safe haven and secure base for our 25 years of marriage.
You are a true friend and I cherish our life together.

To my son, John M. Williams,
Thank you for teaching me how to support you and encourage your exploration.
Being your dad is a joy beyond words. May we be life long friends.

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I am also indebted to Dr. Shelley Jackson and Dr. Sharla Snider who served as members of my dissertation committee. In spite of our limited contact in the classroom both agreed to serve on my committee and remained loyal to the end of this project. I will always be grateful to each of them for their unselfish service and kindness. They gave helpful comments and suggestions that improved this work and stimulated my thinking about future writing projects on attachment, PTSD, and families.

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ABSTRACT

ROBERT HOLDEN WILLIAMS

ADULT ATTACHMENT STYLES AS PREDICTORS OF POSTTRAUMATIC STRESS SEVERITY AND POST TRAUMATIC STRESS DISORDER AMONG U.S. ARMY SOLDIERS

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This study examined the relationships between adult attachment style and posttraumatic stress in a large sample of U.S. Army soldiers recently returned from a combat deployment. Results from responses to the Relationship Style Questionnaire and the Posttraumatic Stress Checklist (n=742) showed that soldiers with an insecure attachment style (preoccupied, fearful avoidant, dismissing avoidant) had statistically significantly higher rates of PTSD than soldiers with a secure attachment style: Secure, 6%; Preoccupied, 25.6%; Fearful Avoidant, 23.6%; Dismissing Avoidant, 11.9%. Soldiers with insecure attachment styles also had statistically significantly higher posttraumatic stress severity (PSS) than soldiers with secure attachment styles. Soldiers with insecure attachment styles that are higher on the anxiety dimension (preoccupied and fearful avoidant) had statistically significant higher intrusion symptom severity than other styles. Soldiers with insecure attachment styles that are higher on the avoidance dimension (fearful avoidant and dismissing avoidant) had statistically significant higher avoidance symptom severity than soldiers with a secure attachment style but not soldiers with a preoccupied style.

This study also examined the associations between adult attachment dimensions and PSS. Results from simple linear regressions (n=759) showed higher attachment anxiety and attachment avoidance independently predicted higher PSS. Results from hierarchical multiple regressions (n=737) showed adult attachment dimensions, anxiety and avoidance, were stronger predictor of PSS than combat exposure, perceived danger, and demographic risk factors. Two cumulative R^2 series showed similar results. In a regression model that assigned causal priority to the attachment dimensions, attachment anxiety and attachment avoidance collectively accounted for a statistically significant greater amount of variance in PSS than combat exposure, 20% versus 7%. Data show perceived danger and being female were also significant predictors of PSS in this sample. The overall hierarchical regression model accounted for 31% of the variance in PSS. This study suggests attachment insecurity and attachment security are risk and resilience factors of PTSD, respectively. The study also suggests contemporary attachment theory is an important theoretical framework with broader implications for the Army. A discussion of implications included Army medicine, the human dimension and capabilities development, leadership, comprehensive soldier fitness, and counseling. The study proposed specific recommendations to use or accelerate attachment research in these areas.

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CHAPTER I

INTRODUCTION

During the past decade, hundreds of thousands of United States (U.S.) military personnel and veterans have been diagnosed with Post Traumatic Stress Disorder (PTSD) following a deployment to Afghanistan in support of Operation Enduring Freedom (OEF) and to Iraq in support of Operation Iraqi Freedom (OIF). Tens of thousands more service members are expected to deploy to dangerous regions in the Middle East for the near future. Consequently, PTSD treatment and resilience research has received unprecedented national attention and federal funding.

Combat experiences are qualifying events for the PTSD diagnosis, but individual responses to potentially traumatic events (PTE) vary. Ultimately, most people do not develop chronic PTSD following exposure. This resilient response to trauma has prompted numerous studies that focused on identifying risk and resilience factors for PTSD development. Meta-analyses (Brewin, Andrews, & Valentine, 2000; Ozer, Best, Lipsey, & Weiss, 2003) summarized these studies and reported the strength of the relationship between risk factors and PTSD. Recent studies with OIF and OEF veterans have used some of the variables they identified as the strongest predictors of PTSD.

Experts in deployment related mental health (U.S. Department of Veterans Affairs, National Institute of Mental Health, U.S. Army Medical Research and Materiel Command, 2006) stated that mental health risk factors receive much more research

attention than resilience or protective factors. They recommended that future studies investigate the mechanisms of risk and protective factors and use theory to guide their efforts. Since attachment theory explains both resilient functioning and psychopathology (Bowlby, 1988) and the mechanisms involved in trauma (Wang, 1997; Schore, 2002) it has been argued that attachment theory provides this needed theoretical framework (Mikulincer, Shaver & Horesh, 2006; Charuvastra & Cloitre, 2008). Further, contemporary attachment theory informs process oriented investigations of PTSD across human systems (i.e., from genes to social influences).

The present research tested hypotheses derived from contemporary attachment theory to predict the prevalence of PTSD and posttraumatic stress severity (PSS) among U.S. Army soldiers following a recent deployment. Data for this study were collected in June 2009 by Army researchers conducting “The Land Combat Study 2: Impact of deployment and combat experiences on the mental health and well-being of military service members and their families.”

Background of the Problem

A Rand Corporation report estimated that 300,000 of the 1.64 million veterans who experienced combat in Iraq or Afghanistan as of October 2007 have been diagnosed with Post Traumatic Stress Disorder (PTSD) and/or depression (Tanielian & Jaycox, 2008). This estimate is similar to the two-year prevalence rate of 18.2% for new diagnoses of PTSD for veterans entering the Department of Veteran Affairs (VA) health care facilities system from January 1, 2006 to March 31, 2008 (Seal et al., 2009). The

period prevalence of a new diagnosis of PTSD for this cohort of 289,328 OIF/OEF veterans who sought VA health services from April 1, 2002 to March 31, 2008 was 62,929 cases or 21.8% of the veterans. The Department of Defense Task Force on Mental Health (2007) called PTSD a "signature injury" of military personnel deployed to these areas of conflict.

As stated earlier, recent studies conducted with OIF/OEF soldiers have contributed to the stock of knowledge about PTSD vulnerability and risk but have not added knowledge about PTSD resilience and protective factors. Studies with these soldiers have investigated increased risk of PTSD associated with demographic factors (i.e., gender, age at trauma, level of education, etc.), differential risks of trauma severity (e.g., combat exposure and experiences), and various groups (e.g., severely wounded, traumatic brain injured, reserve/national guard, etc.). Additional research has focused on selected pre-trauma PTSD risk factors such as, prior stressful life events (Brailey, Vasterling, Proctor, Constans, & Friedman, 2007), exposure to prior stress and family life environment (Vogt & Tanner, 2007), and adverse childhood experiences (ACE) (Cabrera, Hoge, Bliese, Castro, & Messer, 2007; Gahm, Lucenko, Retzlaff, & Fukuda, 2007). In addition to a lack of emphasis on resilience, these research efforts have focused on historical and static risk factors that are not modifiable nor easily translated into preventive health interventions and policies. The study by Brailey et al. (2007) is an exception among this group of studies because it included a modifiable variable, unit cohesion.

Recently, Hoge, Austin and Pollack (2007) noted that investigators mistakenly use the term resilience factors when actually discussing risk factors. They proposed that resilience refers to “psychological and biological characteristics, intrinsic to an individual, that might be modifiable and that confer protection against the development of psychopathology in the face of stress” (p.139). This definition is consistent with an individual differences approach (Yehuda, Flory, Southwick, & Charney, 2006) that investigates the full range of behavioral and biological responses to stress and trauma exposure. So far, published OIF/OEF resilience research have lacked the explicit use of theory or an individual differences approach that can address the complexities of inherently multileveled concepts such as adaptation and resilience.

Attachment theory is a logical theoretical lens for PTSD resilience and risk research with military personnel because of its power to explain adaptive and maladaptive biological, psychological, and behavioral processes and responses to environmental threats. Historical and contemporary theoretical formulations and empirical evidence from animal and human studies have promoted attachment theory to a prominent place in the life and developmental sciences. Attachment theory provides the major scientific basis for the field of infant mental health, a dominant theory of developmental psychology, and is foundational to the discipline of developmental psychopathology (Schore, 2001a). In a review article that examined the neural basis of attachment at the molecular, cellular, and systems levels, Insel and Young (2001) stated, "It is difficult to think of any behavioural process that is more intrinsically important to

us than attachment" (p. 129). Recently, Masten (2007) identified the concepts of attachment relationships and secure attachment as "Hot Spots" for resilience science research. Masten noted that attachment theory offers possibilities for multiple levels of analysis, genetic to global, and a considerable body of findings for research guidance.

Over a decade ago, van der Kolk (1996) wrote a section entitled, "Secure attachments as a defense against trauma" (p. 185). He postulated that the stress buffering role of early social contexts shape individual psychological and biological capacities to deal with later life stressors. He noted that attuned and timely parental interactions modulate an infant's arousal and build a child's capacity to self-modulate while learning to gain support from others. Since then, empirical animal and human research have informed additional theoretical formulations about attachment theory in general and attachment theory and PTSD more specifically. Mikulincer, Shaver and Horesh (2006) stated, "The study of attachment-related processes related to the etiology, course, and treatment of PTSD is an ideal arena for interdisciplinary collaboration" (p. 25).

Statement of the Problem

To date, no studies have applied attachment theory using adult attachment self-report measurements to predict posttraumatic stress severity and PTSD prevalence in the U.S. military population. Specifically, no studies have examined the relationship between attachment style and prevalence of cases of PTSD or the relationship between dimensions of attachment anxiety and avoidance and PSS in this population.

Importance of the Study

This study is the first to examine whether individual differences in adult attachment styles can predict posttraumatic stress in a sample of U.S. Army soldiers following a combat deployment. The study extends research on adult attachment and PTSD to a population critical to society and at greater risk of exposure to PTE. The study is important to soldiers, family members, researchers and military leaders because it provides information about a malleable intrapersonal and interpersonal attribute (i.e., adult attachment style) that may protect soldiers from PTSD and other negative health outcomes. In addition, this study is important because it informs military leaders about the distribution of an individual difference in the active component Army that is associated with numerous individual, interpersonal, and group behaviors. Findings from this study can inform future research and development efforts across major Army commands (e.g., Training and Doctrine Command), programs (e.g., Comprehensive Soldier Fitness program, Army Strong Families) and new Army Centers (e.g., Resilience).

Statement of the Purpose

The purpose of this study was to examine the relationships between individual differences in adult attachment and posttraumatic stress among U.S. Army soldiers recently returned from a combat deployment. Adult attachment styles and adult attachment dimensions were used as predictor variables for this purpose. First, this study examined whether adult attachment styles were significantly related to the prevalence of

PTSD, PSS, and intrusion and avoidance severity. Next, this study examined the relationship between attachment dimensions, anxiety and avoidance and PSS. Finally, this study examined how much variance in PSS was attributed to attachment anxiety and avoidance in a prediction model that included other commonly examined PTSD risk factors (e.g., gender, age, education, perceived danger, and combat exposure).

Hypotheses

The following directional hypotheses were tested to fulfill the purpose of this study:

1. Soldiers with insecure attachment styles (preoccupied, fearful avoidant, or dismissing avoidant) will have a statistically significant higher prevalence of PTSD than soldiers with a secure attachment style.
2. Soldiers with insecure attachment styles will have a statistically significant higher PSS than soldiers with a secure attachment style. Preoccupied and fearful avoidant will have statistically significant higher PSS than secure and dismissing avoidant.
3. Soldiers with preoccupied and fearful avoidant attachment styles will have statistically significant higher intrusion symptom severity than soldiers with secure or dismissing avoidant attachment styles.
4. Soldiers with fearful avoidant and dismissing avoidant attachment styles will have statistically significant higher avoidance symptom severity than soldiers with secure and preoccupied attachment styles.

5. Higher attachment anxiety will be a statistically significant predictor of higher PSS.
6. Higher attachment avoidance will be a statistically significant predictor of higher PSS.
7. Attachment anxiety and attachment avoidance will account for a statistically significant amount of variance in PSS beyond other risk factors.

Theoretical Framework

Modern attachment theory provides a useful way to understand individual differences in posttraumatic stress adjustment. This section presents key concepts from attachment theory, discusses two theoretical models of attachment theory, highlights converging ideas from the PTSD literature that informed this study, and presents an application of adult attachment theory to soldiers in distress during and after a deployment

Key Concepts in Attachment Theory

Bowlby (1988) argued for a view of human nature that included an innate evolution-driven need to make strong emotional bonds with particular individuals, a need to provide care to persons in distress, and a need to explore the environment. Bowlby (1969/1982) proposed that humans mediate these behaviors through “behavioral systems,” a term he borrowed from animal studies. Behavioral systems are the biologically evolved human behaviors that have adaptive functions for the survival of the species (e.g., attachment, caregiving, affiliation, and sex). Systems are activated by

certain stimuli and deactivated by other stimuli when the individual attains the required set goal. The attachment behavior system includes adaptive behaviors that evolved to protect the vulnerable infant from predators and environmental dangers. Maintaining proximity to an attachment figure is the primary behavioral strategy of the attachment system.

Sroufe and Waters (1977) proposed that the set-goal of this adaptive behavior is “felt security” which is mediated by positive affect. Proximity requirements to sustain a state of attachment security involve several factors (e.g., age, health status, perception of danger). Generally, beginning when a child is two years and nine months, their caregiver can leave them with another caregiver without protest from the child (Bowlby, 1969/1982). However, when danger is perceived or the infant becomes otherwise distressed, the attachment system is activated. Under these conditions, the primary or innately evolved strategy of the attachment behavior system is to seek proximity to an attachment figure for protection and support. Bowlby (1969/1982) argued that if the attachment figure is accessible, sensitive, and responsive to the infant’s attachment related behavior, the infant attains their set-goal, and the attachment behavioral system deactivates. Infants usually direct their earliest attachment behaviors towards their mother or other primary care giver for a “safe haven”. Other attachment figures may serve this attachment function later. The cycle—experiencing distress, seeking protection or comfort, experiencing security, and returning to other activities—provides a prototype for successful emotion regulation, interpersonal closeness (Mikulincer & Shaver, 2007) and

positive mental health. The provision of a “secure base” for exploration that encourages the child’s return to other activities is a vital function of an attachment figure and key concept of attachment theory (Bowlby, 1988).

The attachment cycle, as described above, demonstrates the complementary relationship between the attachment system and the caregiver system. It also explains the connection between the attachment system and the exploration system in the individual. When an individual detects a perceived threat, the attachment system takes priority over the exploration system to facilitate the higher and more urgent need of the individual to alleviate distress. Once the set goal of felt security is obtained, the exploration system will reactivate.

Three key propositions in Bowlby’s work (1973) have particular relevance to this study. First, the expectations a person develops about the availability and responsiveness of an attachment figure are reflected in their responses to distress, affecting future relational experiences. Bowlby (1969/1982, 1973, 1980, 1988) explains that individual differences in attachment figures’ responses to child’s distress correspond to variations in how emotional bonds form and become organized. In cases where an attachment figure has been inconsistently responsive and available or consistently unresponsive and unavailable, a child will develop a secondary attachment strategy: hyper-activation or deactivation (Main, 1990). In the former strategy, individuals intensify attachment behaviors to get help and may present as overly needy or demanding. In the latter

strategy, individuals suppress attachment behaviors to get help and may withdraw from relationships.

Second, individuals who are confident about an attachment figure's availability will be less vulnerable to intense or chronic fear than someone who lacks that confidence. Referring to the social regulation of fear, Bowlby (1973) wrote,

In the presence of a trusted companion fear of situations of every kind diminishes; when, by contrast, one is alone, fear of situations of every kind is magnified.

Since in the lives of all of us our most trusted companions are our attachment figures, it follows that the degree to which each of us is susceptible to fear turns in great part on whether or attachment figures are present or absent. (p. 201)

Bowlby linked the mind, relationships, and the brain as critical components for understanding fear and its regulation.

Third, the confidence or lack of confidence in an attachment figure from infancy, childhood, and adolescence endures with little change across the life course. Bowlby (1969/1982) proposed that over time individuals build cognitive-affective working models of their social environment and their own capabilities to attain the set goal of security within it. He suggested that these working models include information related to the individual's attachment figures that includes their location and how they will probably respond. In addition, Bowlby argued that individuals build a working model of the self that reflects their sense of how acceptable or unacceptable they are with regard to an attachment figure. Working models operate primarily unconsciously (Bowlby, 1988)

and become prototypes of future social relationships; they influence how individuals perceive events, forecast the future, and construct plans (Bowlby, 1973). Preconscious activation of the attachment system increases an individual's access to internal working models of attachment figures for use in information processing and action (Mikulincer & Shaver, 2007). Working models that individuals create of attachment figures during the sensitive periods of infancy, childhood, and adolescence persist mostly unchanged across the life course. As individuals age and have more distress alleviating experiences with an attachment figure their need to for proximity seeking diminishes, and interpsychic closeness is enough to provide a sense of security (Mikulincer & Shaver, 2007a).

Figure 1 illustrates the prototype view. Core internalized working models or associative cognitive-affective networks that developed from interactions with an individual's earliest attachment figure provide a template for subsequent relationships with potential attachment figures. Across the life course, individuals have the potential to add attachment figures from new social contexts (e.g., military). Mikulincer and Shaver (2007) noted individuals select various attachment figures across the life course as sources of support and comfort. These include organizational leaders, groups, institutions, and symbolic figures (e.g., God). Experiences with new attachment figures across the life course generate new internal working models or mental representations in an individual's mind.

Bowlby (1973, 1988) never proposed a deterministic view of the attachment control system. He argued that human physiological and behavioral processes evolved to

be less plastic to keep individuals on their original developmental course and individual's subsequent development is not fixed but open to change in a new environment.

Regarding this matter, Bowlby (1988) wrote, "It is this continuing potential for change that means that at no time of life is a person invulnerable to every possible adversity and also that at no time of life is a person impermeable to favorable influence" (p.136).

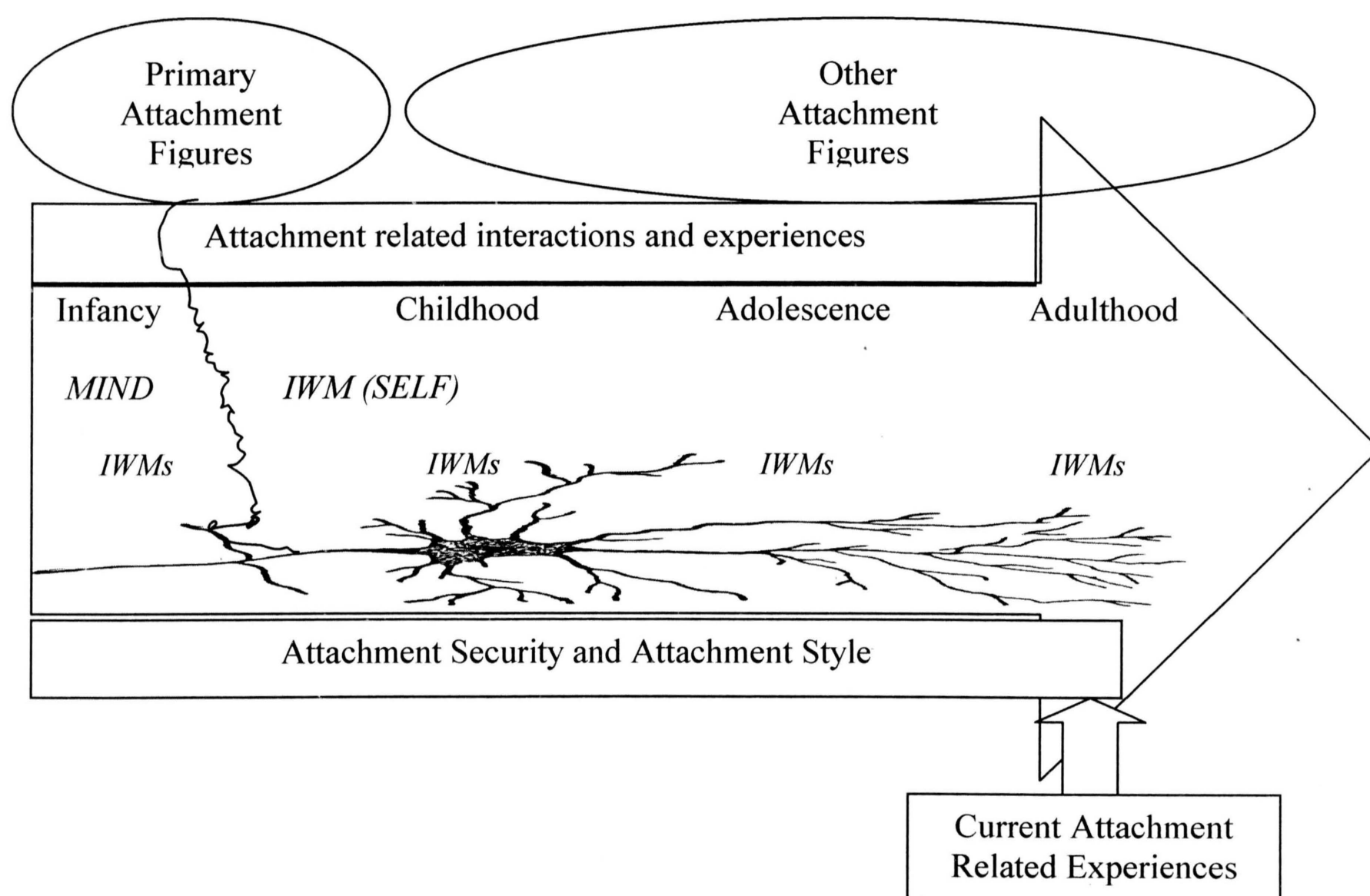


Figure 1. The prototype view of attachment security and style across the life course. Drawing shows the determinants of adult attachment style and security include an individuals' general attachment style, internal working models (IWMs) of self and others, and current attachment experiences. The scribble line represents the neurobiological programming of stress systems by early experiences with primary attachment figures. Clipart of nerve cell is courtesy of Florida Center for Instructional Technology (FCIT).

Ainsworth, Blehar, Waters, and Wall (1978) developed an observational procedure called the Strange Situation to assess the quality of attachment bonds between

infants and parents. The three patterns of attachment behavior that were identified can be simply referred to as secure, anxious, and avoidant; these patterns provided the foundation for subsequent research on the individual differences of attachment behavior (Mikulincer & Shaver, 2007a).

Hazen and Shaver (1987) extended attachment theory to adults and developed a multi-sentence self-report measure based on these types. They found the same relative prevalence of attachment patterns in adults as in infants. Bartholomew and Horowitz (Bartholomew, 1990; Bartholomew & Horowitz, 1991) noted that a four- type model including two avoidant categories was better than a three-type model for describing adult attachment patterns. They interpreted the two orthogonal dimensions as working models of an individual's degree of positive or negative view of self and other. In a recent model of attachment in adulthood, Mikulincer and Shaver (2003, 2007a) conceptualized the underlying dimensions of attachment security in terms of attachment-system functioning rather than working models. Brennan, Clark, and Shaver (1998) factor- analyzed all extant self-report measures and found that attachment related anxiety and avoidance were the higher common factors in these scales. Fraley and Waller (1998) attempted to resolve the debate over whether to measure attachment as a category or as a dimension. They applied taximetrics procedures to a large sample of adult attachment data and determined that conceptualizing adult attachment as a dimension rather than categories best fit the data. Figure 2 shows the attachment dimensions and the categories assigned to individuals based on their scores on these two dimensions.

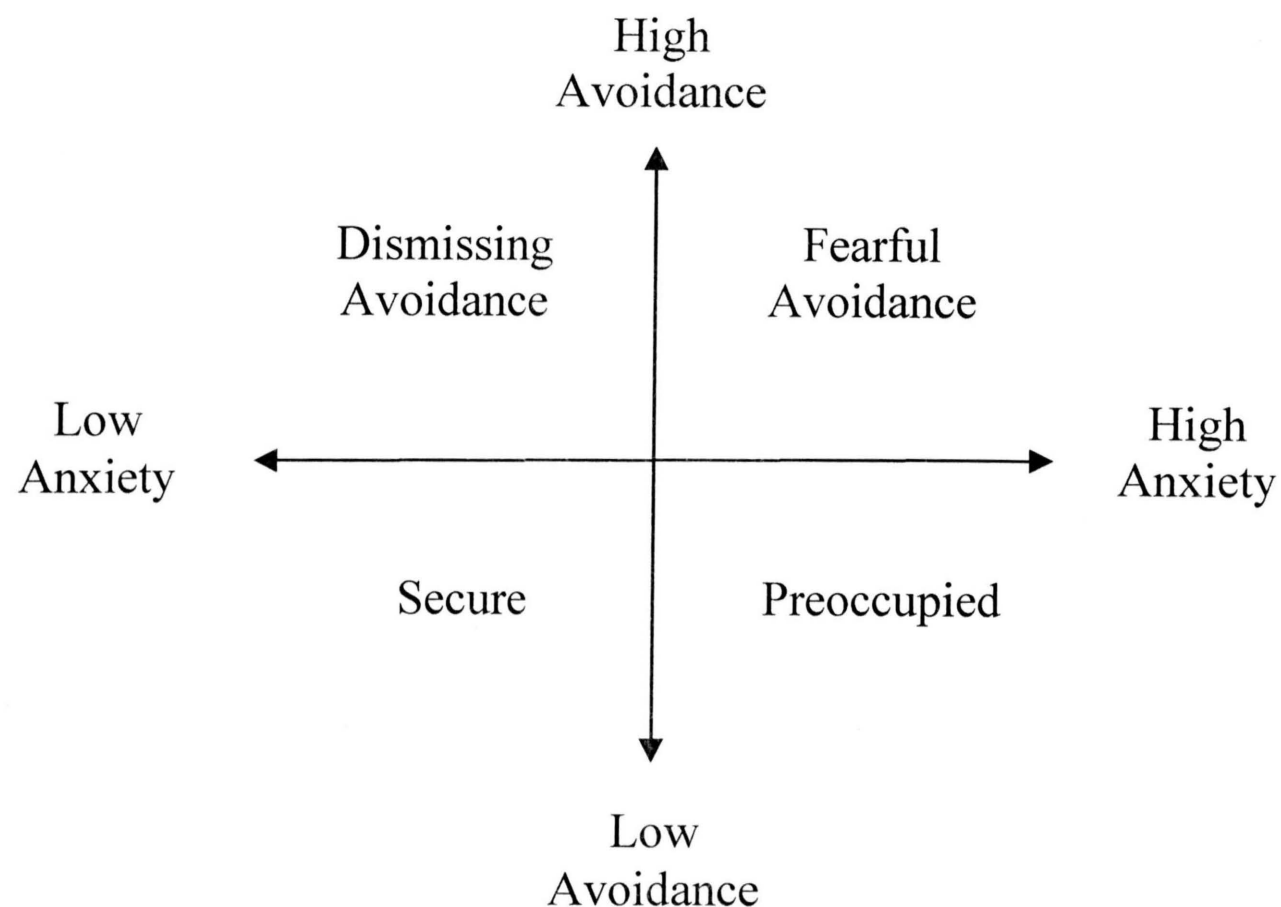


Figure 2. Attachment dimensions and categories. Two dimensions of attachment security, anxiety and avoidance, with categories recommended by Bartholomew (1990) in the space created by their intersection. This study measured these four categories and two dimensions with the RQ and ECR-Short form, respectively.

A Model of Attachment System Functioning and Dynamics

This research used a model of attachment system functioning proposed by Mikulincer and Shaver (2003, 2007; Shaver & Mikulincer, 2002). Mikulincer and Shaver indicated that their model is based on the theoretical writings of Bowlby (1969/1982, 1973, 1980), Ainsworth (1991), Cassidy and Kobak (1998), Main (1995) and a large body of research literature; additionally, their current model is an extension and refinement of earlier integrative work (Shaver, Hazan & Bradshaw, 1988; Fraley & Shaver, 2000). The model developed in the context of modern personality and social psychology that emphasizes adolescent and adult development and interpersonal

relationships. Applying attachment theory that has emerged from this context is an excellent fit for soldier research in general and specifically to soldier posttraumatic stress research because of the recognized importance of the social environment in PTSD risk and prevention literature.

The model depicted by Figure 3 (Mikulincer, et.al, 2006) reads from top to bottom in sequence. From the top through the element labeled “seeking proximity to external or internalized attachment figure,” the model is concerned with the sources of threat and the activation of the attachment system. After this point, the middle of the model is concerned with the availability of attachment figures. Beginning with the element “Is proximity seeking a viable option” to the end, the model is concerned with the two primary strategies used in response to insecurity and distress. The model addresses three issues related to attachment theory: (1) proximity seeking or seeking support; (2) the positive outcomes that result when the primary strategy, seeking support, is successful; and (3) individual differences and secondary strategies (anxious hyper-activation and avoidant deactivation) that develop when an attachment figure is unavailable or unresponsive to bids for protection and support.

This control system model includes a series of questions that follow an If-Then format. The yes or no responses to questions in the model occur mostly unconsciously and result from earlier experiences with attachment figures and attempts to regain a sense of security after threats. The outcomes from the primary or secondary strategies (i.e., a sense of security or insecurity) feed back into the model. These outcomes influence the

subsequent appraisal, monitoring of threats and the feasibility of obtaining a sense of security from one's attachment figures. Positive and negative symbols represent the postulated excitatory and inhibitory neural circuits that develop from recurrent use of hyperactivating and deactivating strategies. Mikulincer and Shaver (2007) view hyperactivating and deactivating strategies as operating independently of one another but they concede that "disorganized" or "fearfully avoidant" strategies that include both anxiety and avoidance as described by Bartholomew and Horowitz (1991) and Main and Solomon (1990) may be a primary strategy for some individuals.

All aspects of the model are sensitive to contextual or situational factors and the general disposition or personality traits of individuals (Mikulincer & Shaver, 2007a). Specific situations in which an individual perceives danger and has current information about the availability or unavailability of an attachment figure triggers "bottom-up" processes that affect attachment system functioning. Mikulincer and Shaver illustrate the contextual sensitivity of the model by reporting that priming an individual with statements about attachment figures availability in the past can facilitate a change in attachment security and behavior, even among individuals with chronic attachment insecurity. Mikulincer and Shaver define attachment security as a state where individuals rarely need to use secondary hyperactivating or deactivating strategies when distressed.

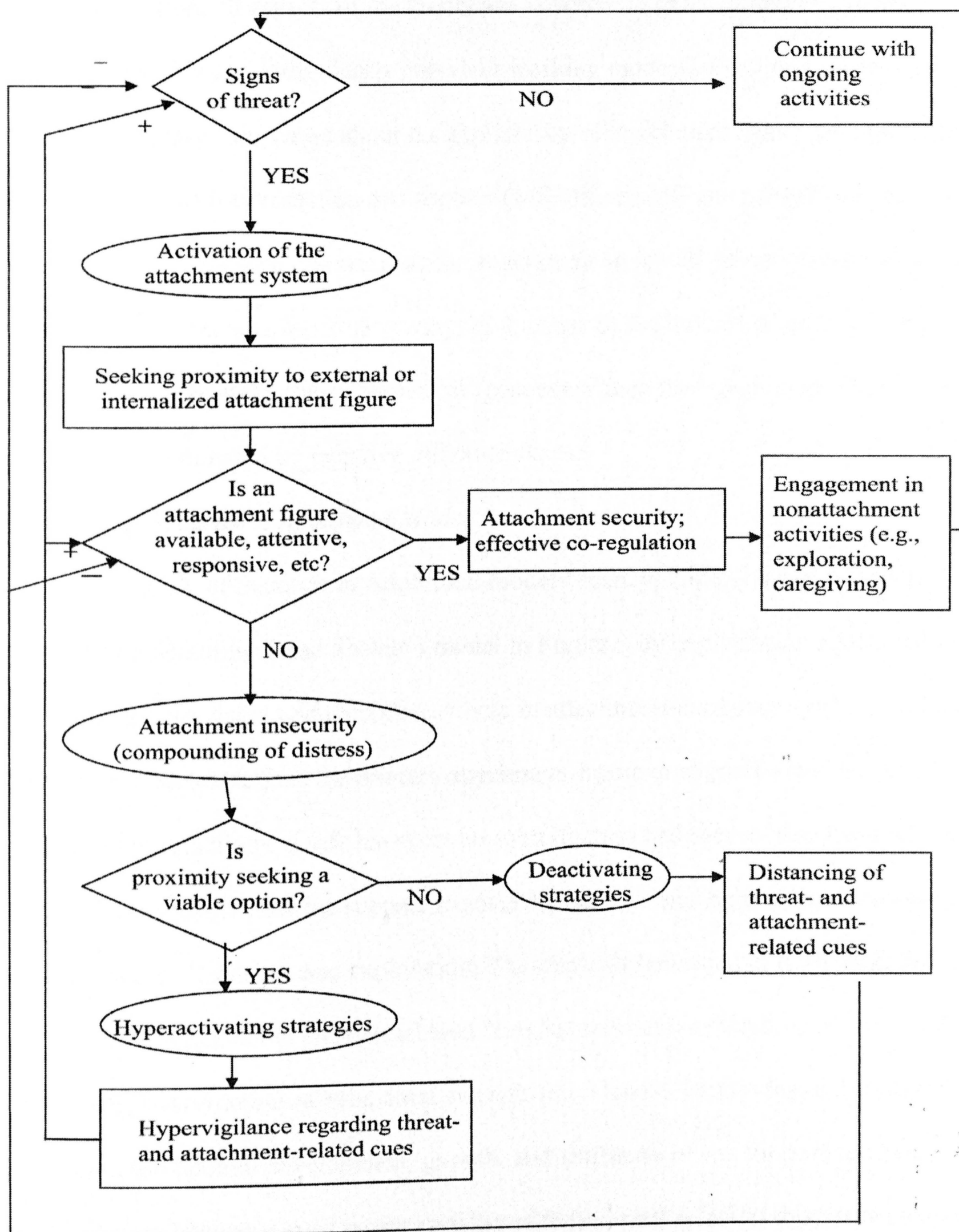


Figure 3. Mikulincer and Shaver's model of attachment system dynamics and activation. Reprinted from Mikulincer et al. (2006, p. 79).

In addition, all aspects of the model are sensitive to chronic attachment styles. Biases derived from an individual's prevalent working models of self and others can effect threat perception, views about the availability of attachment figure, and the utility of seeking support for protection and support (Mikulincer & Shaver, 2007a). For example, individuals with chronic anxious attachment style will perceive more events as threatening and others as less trustworthy. In the case of the individual with a chronically anxious attachment style, these "top-down" processes keep the attachment system activated and dominated by negative affective states.

The Circle of Security in Adulthood Model

The Circle of Security in Adulthood model (Feeney, 2004), shown in Figure 4, complements Mikulincer and Shaver's model in Figure 3 by depicting an additional level of detail in the provision and reception of help in attachment-caregiver dyads. The Circle of Security model describes the primary attachment figure or support-provider fulfilling their two main functions: a safe haven in times of distress and secure base from which to explore. It also shows how the support-receiver by nature seeks help when distressed and by nature seeks challenges and exploration. The circle of security can fit in Mikulincer and Shaver's model, at the element labeled "Engagement in nonattachment activities" to illustrate the coordination of behavioral systems (attachment, caregiving, exploration) involved in the optimal development, growth, and resilience of the support-receiver. Mikulincer and Shaver's most recent revision of their model refers to this same element as the "Broaden-and-build cycle of attachment security". Mikulincer and Shaver borrow

the term broaden-and-build from Frederickson’s (2001) theory of positive emotion, and propose that “felt security” obtained from receiving support from another is the foundation for the cycle of positive emotions. They posit that repeated experiences of “felt security” builds an individual’s positive mental representations of self and others and strengthens their motivation to approach new challenges, explore opportunities, and embrace personal growth.

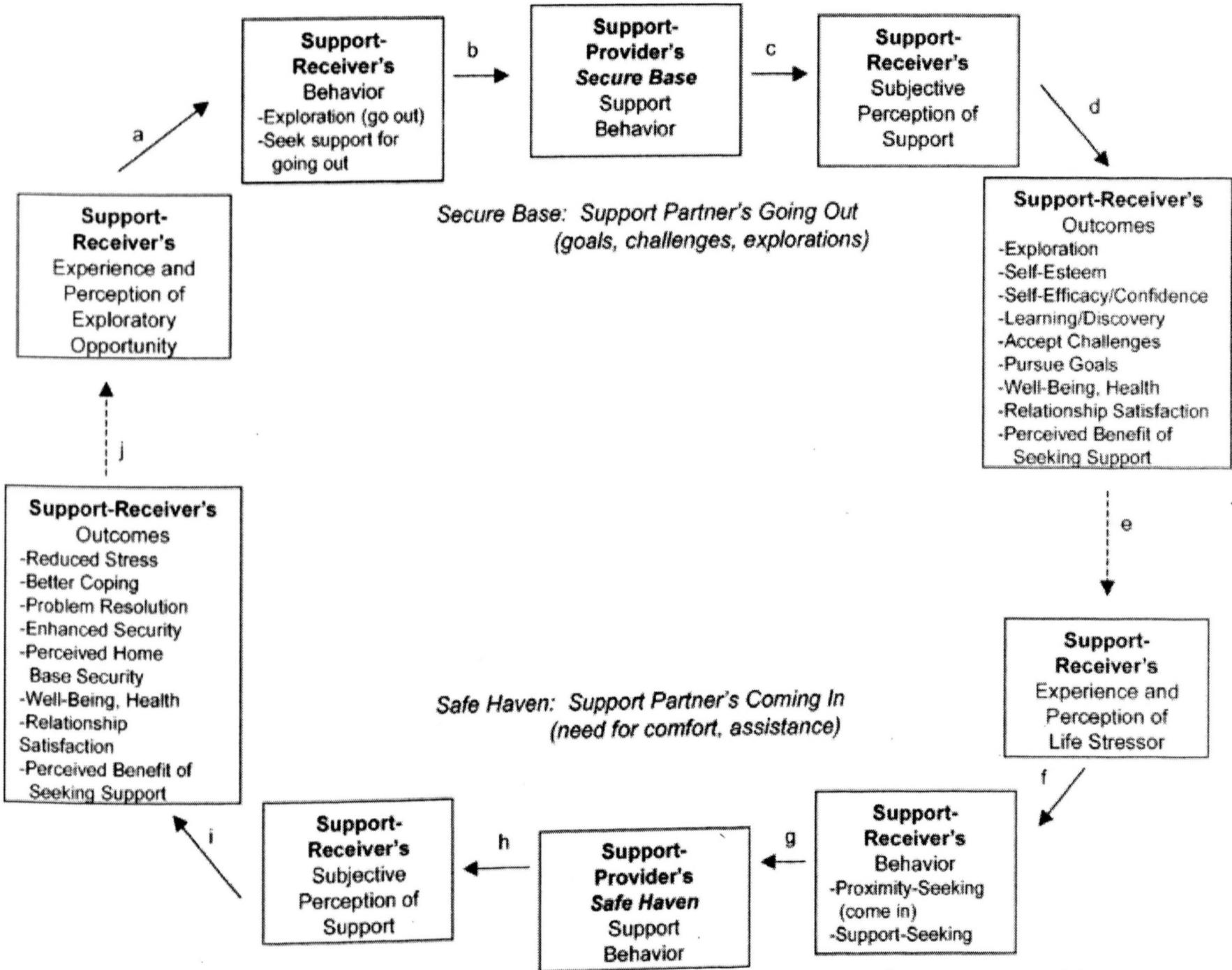


Figure 4. Circle of Security in Adulthood: Interpersonal model of support-seeking (attachment), support-provision (caregiving), and exploration. Reprinted from Feeney (2004, p. 633).

This model provides an excellent heuristic for young adults who accept the challenges and opportunities associated with military service and military leaders who accept responsibility for their care and development. The circle of security model presented in Figure 4 shows a support-receiver paired with support-provider and the cycle of normative responses and positive outcomes in this kind of relationship.

Modern Attachment Theory as a Stress and Psychological Theory of PTSD

Bowlby (1969/1982) identified the loss of a mother figure in infancy and early childhood was a traumatic event. He held this was true for separations that may be of short duration. Unlike other psychoanalysts of his day, Bowlby accepted a mother's absence as a valid explanation for a child's distress and anxiety. Bowlby (1969/1982) set out to apply the principles of physiological medicine to study the psychological and psychopathological processes that resulted from this trauma. He noted that this approach to research results in broad application rather than a particular clinical syndrome. Since attachment theory is a developmental theory of human social and emotional development, it can address both distal and proximate influences on the course of posttraumatic stress reactions. At the same time, it applies to health, human functioning, and behavior more generally.

Over a decade ago, McFarlane and Yehuda (1996) proposed a process model to explain the longitudinal course of PTSD. They argued that PTSD does not develop as an immediate response to a PTE but emerges from the pattern of acute distress triggered by the event. Attachment theory explains several factors they used in their model (e.g.,

personality, biological traits, support, and coping style). In their conceptual model, McFarlane and Yehuda viewed social support as an individual's ability to recruit their social network following trauma exposure. Mikulincer and Shaver (2009) explained how attachment theory offers a perspective about social support that involves seeking support, receiving of support, and providing support. The conceptual model used in this study includes a process model of the development of posttraumatic stress informed by attachment theory.

Recently, developmental scientists have helped clarify the neurobiological processes involved in the mother-child dyad and the benefits of secure attachments. Data from this level of analysis informs all human systems above it. Modern attachment neuroscience provides bottom up support for Bowlby's prototype hypothesis. Schore (2001a) noted that "the decade of the brain" (i.e., January 1990-2000) included the converging of the rapid growth in theory and technology in the neurosciences with the focus of attachment researchers on the dyadic psychobiological activity in the earliest social relationship, the infant and mother. Schore credited the integration of these two scientific efforts with establishing the now accepted view that brain maturation is experience-dependent. Schore (2001a,b) integrated interdisciplinary data from this decade and proposed a developmental psychoneurobiological model that linked the primary caregivers stress regulating and dysregulating interactions with the infants maturing limbic circuitries in the developing right brain. His regulation theory (Schore, 1994, 2001a,b) provides important information about the neurobiology of attachment and

the mechanisms and processes that give rise to adaptive and maladaptive infant mental health that influence later mental health.

Schore (2002) reviewed data from advances in attachment theory, affective neuroscience, developmental stress research, and infant psychiatry regarding the development of PTSD. He noted that the data suggest traumatic attachments or parents with a poor ability to comfort and regulate their child's affective states put a child at increased risk for PTSD. Increased risk comes from episodes of distress followed by hyperarousal and dissociation that cause changes in a child's brain chemistry that alters brain structure, specifically connections in the right orbitofrontal cortical-subcortical system. These early structural changes alter the optimal developmental course of the right brain with enduring effects across the life course.

Other neuroscientists and PTSD researchers (e.g. Henry, 1993, 1997, Henry & Wang, 1998, Wang, 1997) have examined and discussed how biological and social processes relate to the development of PTSD and other adverse outcomes. Henry (1993 & 1977) did seminal work on biological processes, PTSD, and human bonding. He proposed chronic stress was associated with a self-preservative physiological state that impaired access to species preservative behaviors (e.g. attachment, empathy, reverence, and positive emotions). Henry's propositions fit with Mikulincer and Shaver's (2003, 2007) model of attachment dynamics and functioning. Specifically, biological models that explain how social stress damages brain circuitry that implement positive affect and prosocial behavior support the broaden-and-build cycle of attachment security.

Mikulincer and Shaver suggests repeated experiences of felt security, relief, and positive affect in the presence of attachment figures when distressed results in a broaden-and-build cycle of attachment security. The cyclic experiences of distress and its effective regulation within the context of an attachment figure build up a rich supply of positive mental representations of self and others, and a sense of self-efficacy when distressed. In contrast, individuals who lack consistent responsive and sensitive attachment figures when distressed will have relatively fewer positive mental representations of self and others, and lack a sense of effective distress management.

One critique leveled against Mikulincer and Shaver's model is the model's lack of attention to the physiological systems related to felt security and the process of attachment formation (Sbarra & Hazen, 2008). Sbarra and Hazen proposed that the examination of the biology and behavior of attachment figure loss would provide a way to understand normative attachment formation and would extend the model. Earlier, Diamond (2001) argued for biological theory driven research in adult attachment that uses psychophysiology measures. Diamond proposed that the neglected study of the psychobiological properties of the attachment system would benefit from joining theory and method. She identified the extant literature on the biological systems and proposed the two systems that were the most promising for adult attachment research: the parasympathetic branch of the autonomic nervous system and the hypothalamic-pituitary-adrenocortical (HPA) axis of the endocrine system.

Mikulincer and Shaver (2007a) mentioned that attachment researchers are progressing to understand the physiological processes that Diamond (2001) and Sbarra and Hazen (2008) have recommended extending in attachment research. However, Mikulincer and Shaver's model does not include these specific physiological processes. Their model includes biological structures or "neural circuits" that develop from repeated activation of hyperactivating and deactivating strategies.

The international consensus group on depression and anxiety began their latest update on PTSD with a comment that early life trauma is recognized as a significant risk factor for psychopathology (Ballenger et al., 2004). They noted that the research suggests that trauma which occurs during sensitive developmental periods can lead to durable change in brain structure and functioning that increases vulnerability to subsequent trauma. Recently, Charuvastra and Cloitre (2008) reviewed the literature on interpersonal trauma, social support, and PTSD risk. Their review included an integration of contemporary attachment theory, developmental psychology, and social neuroscience. They proposed a conceptual framework called the "social ecology of PTSD" for understanding the affect of social phenomena on the risk and recovery of PTSD. They suggested insights from neurobiological research on social bonding point to the mechanisms that may offer felt security and promote emotion regulation. Mikulincer and Shaver's (2006, 2007a) model of attachment dynamics and functioning provides a theoretical framework for multi-disciplinary and multi-leveled investigations of the social ecology of PTSD.

Conceptual Model

Mikulincer and Shaver's theoretical model provided the foundation for applying attachment theory to soldiers. The conceptual model used in this study (Figure 5) illustrates how attachment style moderates the relationship between a potentially traumatic event and soldiers' acute and persistent reactions. The model provides a process model of posttraumatic stress adjustment.

The proposed model assumes attachment style influences adjustment to potentially traumatic events during deployment and adjustment to combat stress reactions during post-deployment. This model includes general attachment style, specific attachment style, and the quality of current attachment relationship as moderators of distress following a potentially traumatic event or distress related to combat stress reactions. This study was limited to investigating general attachment styles only. Current quality of support from soldiers and leaders is included in the model for the deployment environment and others (e.g., intimate partners, spouses) are included in the post-deployment environment.

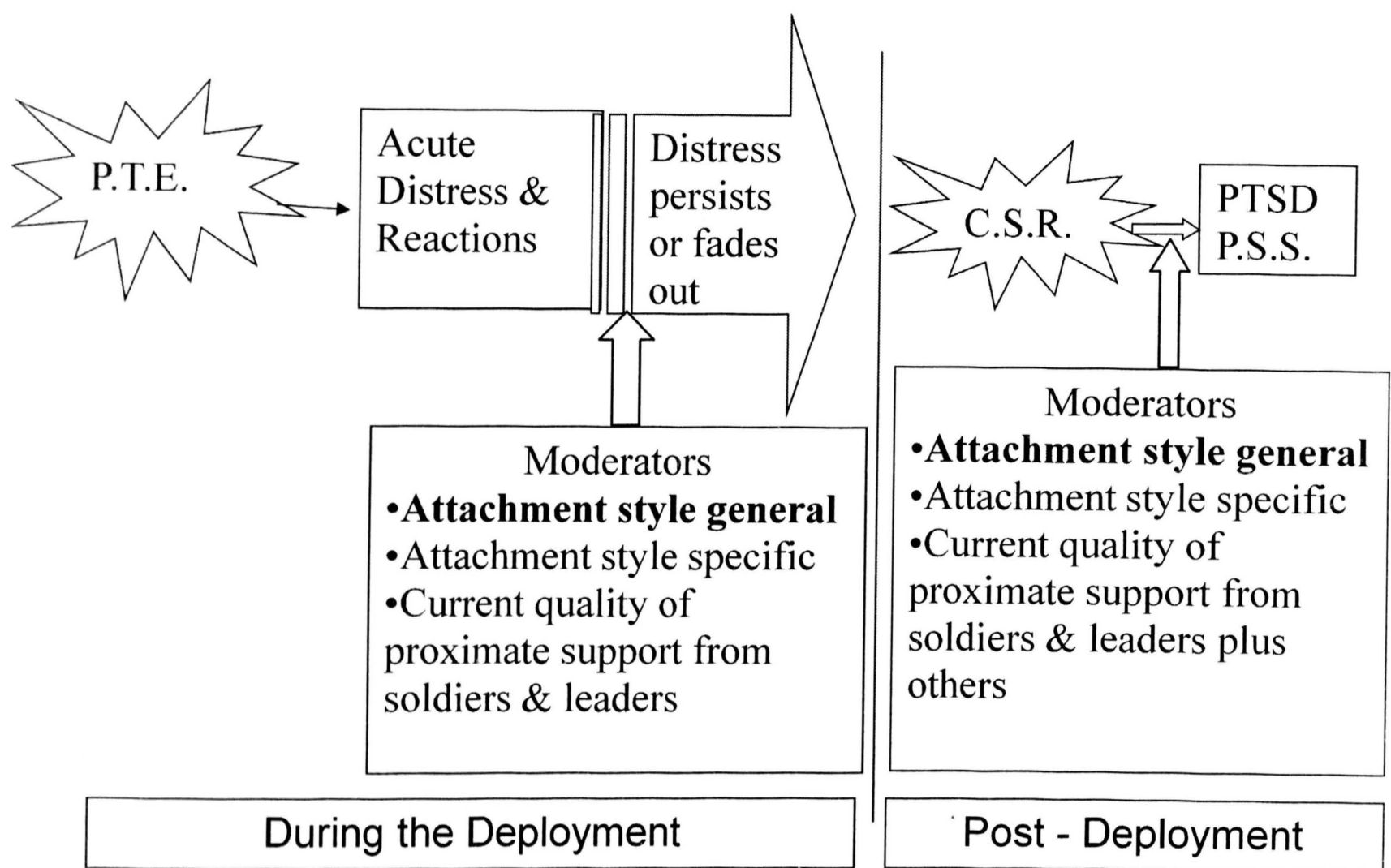


Figure 5. Conceptual model of adult attachment style and attachment security as moderators of PTSD and PSS.

Definitions

Attachment styles – cognitive, affective/emotional, and behavioral patterns that first develop in an individual’s early childhood interactions with a primary parenting figure. Attachment styles are conceptualized as four patterns in a two dimensional space. In this study, one and only one response on the first portion of Relationship Questionnaire (Bartholomew & Horowitz, 1991) was used to assign participants into one of four styles: secure, preoccupied, fearful avoidant, or dismissing avoidant. Attachment styles can be measured as patterns operating across all relationships or in specific relationships and contexts. This study focused on

general or global attachment. These refer to an individual's earliest attachment relationship and the residual influence it has on current functioning and behavior.

Attachment dimensions – two orthogonal dimensions attachment anxiety and avoidance fit the data better for the latent structure of the attachment construct than attachment categories (Fraley & Waller, 1998). This study used the Experiences in Close Relationships-Short form (ECR-short form; Wei, Russell, Mallinckrodt, & Vogel, 2007) to measure the two attachment dimensions: attachment avoidance and attachment anxiety.

Attachment avoidance – the degree that someone seeks to retain behavioral independence and emotional distance from others and trusts a relational partner's acts of goodwill towards them (Mikulincer & Shaver, 2007a). A score for attachment avoidance was determined by calculating the sum of six items on the ECR-Short form (1R, 3, 5R, 7, 9R, 11) after making corrections for reverse scored items.

Attachment anxiety – the degree that someone worries that a relationship partner will be available when needed (Mikulincer & Shaver, 2007a). A score for attachment anxiety was determined by calculating the sum of six items on the ECR-Short form (2, 4, 6, 8R, 10, 12) after making corrections for reverse scored items.

Attachment security – the state resulting from an assurance in seeking support and proximity that provides self security during threatening situations; an inner view of self as competent and worthy of love; not needing to use hyperactivating or

deactivating strategies to down regulate oneself when experiencing threat (Mikulincer & Shaver, 2007a; Shaver & Mikulincer, 2002).

Combat exposure and experiences – the sum of responses to 34 events or experiences that are often seen and/or experienced in war. Items were dichotomized into never happened or happened once or more times (Range 0-34). Higher scores indicated more exposure to potentially traumatic events.

Perceived danger of injury or death – a number ranging from 0-399 that refers to the number of times a soldier perceived their life was in danger of injury or death during the deployment.

Post Traumatic Stress Disorder (PTSD) – a psychiatric condition that fits the criteria for a condition by this name and detailed in the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed; text rev.; *DSM-IV-TR*; American Psychiatric Association, 2000).

Posttraumatic stress severity (PSS) – the sum of all seventeen items on the PTSD checklist (PCL) (Weathers, Litz, Herman, Huska, & Keane, 1993).

Strict PTSD – cases that included responses meeting DSM-IV symptom cluster criterion (i.e., at least one intrusion symptom, three avoidance symptoms, and two hyperarousal symptoms at a moderate level or greater level) and a score of equal to or greater than 50 on the PCL.

Sensitive PTSD – cases that included responses meeting DSM-IV symptom cluster criterion (i.e., at least one intrusion symptom, three avoidance symptoms, and two hyperarousal symptoms at a moderate level or greater level).

Intrusion symptom severity – the penetration into consciousness of thoughts, images, feelings, and nightmares about a traumatic experience. Intrusion symptoms are measured by calculating the sum of intrusion items 1-5 on the PCL.

Avoidance symptom severity – the tendencies of psychic numbing, conscious denial of meaning and consequences of the trauma, behavioral inhibition, and counter-phobic activities related to trauma. Avoidance symptom severity was measured by calculating the sum of avoidance symptom items 6-12 on the PCL.

Assumptions

1. Some soldiers included in the study may have had high PSS and met criteria for probable PTSD before this deployment. Hoge et al. (2004) found 9.4% of soldiers meet the sensitive or broad criteria for PTSD according to the PCL before deployment to Iraq.
2. Soldiers self-reported general attachment styles measured did not change substantially from before the deployment to time of measurement following the deployment. The evidence that adults change their general attachment styles following stressful events has not been consistent (Davila & Cobb, 2004).
3. Post deployment intrusive symptoms activate the attachment behavioral system, and soldiers' adult attachment orientation will influence their actions, thoughts,

and feelings in response to their symptoms in the same way as during the deployment.

4. Since study participation was voluntary and confidential, it is assumed that soldiers who participated in the study provided truthful responses.

Delimitations

This study was confined to investigating the affects of adult attachment styles on posttraumatic stress severity and the prevalence of PTSD in active component Army soldiers at a specific period, three to six months, after a combat deployment. The study also was confined to using the general attachment styles data to predict PSS and did not investigate the convergent validity of the two adult attachment measures.

Limitations

- Like most PTSD research, the data were collected retrospectively. This prevented making definitive statements about the direction of the association between adult attachment security and posttraumatic stress severity.
- The data came from a convenience sample. This prevented generalizing the findings to the population.
- The RQ was an abbreviated version of the original instrument. This prevented cross validating any soldiers forced answers on that instrument.
- This was the first time the ECR-Short form was used in a military population; thus, the reliability and validity for this population has not been established.
- The study only investigated soldiers' general attachment style and not the quality

of their current social environment. This prevents understanding how the soldier's current context of attachment relationships might moderate a soldier's general attachment style.

Summary

Hundreds of thousands of military personnel have developed PTSD following a deployment into war zones in Iraq and Afghanistan. Since the majority of persons who are exposed to a potentially traumatic event do not develop this disorder, there is great interest in discovering individual differences in these two groups. Life scientists have acknowledged the importance of attachment theory for behavioral research.

Neuroscientists, trauma researchers and psychologists have proposed mechanisms and theories relating attachment to PTSD protection and vulnerability. Modern attachment theory like the theoretical control systems model of attachment-system functioning and dynamics (Mikulincer & Shaver, 2003, 2007a; Shaver & Mikulincer, 2002) offer a promising framework to identify and explain individual differences in the etiology, development, and course of PTSD. This study was the first to apply attachment theory hypotheses to data from a population sample of active component U.S. Army soldiers and to report the attachment styles and dimensions of military personnel from this part of the Department of Defense. Study findings supported the notion that insecure attachment styles are associated with increased risk for PTSD and secure attachment is associated with protection for PTSD. This study was limited by the use of retrospective data and only having data on general attachment styles. Prospective studies are needed to address

the direction of associations between general attachment styles and posttraumatic stress. Future research should also include relationship specific attachment assessments to explore the influence of soldiers' attachment relationships with other soldiers and unit leaders who are physically accessible following traumatic events.

CHAPTER II

LITERATURE REVIEW

This chapter contains into two major sections. The first section reviews literature on PTSD and PSS research with a selected population group of active duty soldiers. The second section reviews literature on PTSD, PSS and adult attachment in selected population groups of adults.

PTSD Prevalence and PSS in U.S. Soldiers (Active Component)

This section examines literature that includes key predictor variables (i.e., attachment style and attachment dimensions) and dependent variables (i.e., PTSD prevalence and posttraumatic stress severity). Articles related to the dependent variables are limited to studies that assessed the prevalence of PTSD and posttraumatic stress severity among non-help seeking active duty Army soldiers three to six months after returning from OIF or OEF. This delimitation was based on differential rates of PTSD prevalence by time (Ramchand, Karney, Osilla, Burns, & Caldarone, 2008) and military component (Milliken, Auchterlonie, & Hoge, 2007).

A recent literature review of epidemiological studies involving OIF and OEF veterans (Ramchand et al., 2008) identified four studies that assessed the prevalence of PTSD among active component soldiers during the period of three to six months after returning from a deployment to Iraq or Afghanistan. Only three of these studies (Hoge et al., 2004; Milliken, et al., 2007; Vasterling et al., 2006) are included in this review

because the fourth study (Lapierre, Schwegler, & Labauve, 2007) used a PTSD instrument that is not in common use. The other three studies used either the PCL or Primary Care-PTSD (PC-PTSD), instruments that are used in ongoing PTSD research and mental health screening programs in the Army. None of these studies examined the relationship between PSS or cases of PTSD and the demographic covariates or the perceived danger variable included in the current study. Only one study mentioned the rates of PTSD for age. Effect sizes of demographic variables and perceived danger are provided at the end of this section from another source as a reference for comparing the effect sizes for these covariates in this study.

The first research reported on the prevalence and risk of PTSD among OIF and OEF soldiers (Hoge et al., 2004) assessed PTSD at three to four months after soldiers returned from eight and six month deployments, respectively. Positive cases of PTSD based on DSM-IV cluster method were 18.0% for OIF soldiers and 11.5 for OEF soldiers. Positive cases of PTSD based on a strict criteria (i.e., DSM-IV cluster criteria and ≥ 50 total score on PCL) were 12.9% for OIF soldiers and 6.2% for OEF. Significant differences in the population prevalence were attributed to the level of combat exposure in the two combat areas. An 18-item instrument was used to collect data on combat exposure and experiences. A strong positive correlation was found between number of firefights and positive cases of PTSD in both OIF and OEF soldiers. Exposure to no firefights was associated with PTSD prevalence of 4.5% in both samples and exposure to

five or more firefights was associated with prevalence rates of 19.3% and 18.9% for OIF and OEF, respectively.

Vasterling et al. (2006) included a report of PTSD prevalence in a prospective cohort-controlled study that examined the neurocognitive effects of a year-long deployment to Iraq on 654 active duty soldiers. Assessments were taken a median of 75 days after soldiers returned and showed PTSD prevalence rates were 11.6% based on a strict diagnostic criteria (i.e., cluster method and ≥ 50 total score on PCL). Summary mean and standard deviation scores for the PCL were 32.30 and 13.13, respectively.

Bliese, Wright, Adler, and Thomas (2006) found the prevalence rates of PTSD increased from 2.98% to 8.42% in a matched sample of 509 soldiers who were assessed immediately after returning from a deployment to Iraq and 90 to 120 days post-deployment. At Time 1, over 80% of soldiers who scored positive for PTSD only scored positive on this dimension and not depression. At Time 2, less than 60% of soldiers who scored positive endorsed only PTSD. This study also found co-morbidity increased over this time too. These findings about the course of PTSD and other mental health symptoms in this study led to a new DOD policy in 2005 that required a post-deployment psychological screening at three to six months for all military personnel who deploy on combat operations. This study also validated the Primary Care–Post-Traumatic Stress Disorder screen (PC-PTSD), a four-item instrument used by the Department of Defense in post-deployment assessments.

Milliken et al. (2007) examined the prevalence of PTSD in 56,350 active duty soldiers using data from the Post Deployment Health Assessment (PDHA) program initiated in 2005. These soldiers had previously completed post-deployment screening immediately upon return from a combat deployment in Iraq and three to six months later. The PDHA program uses the four-item Primary Care-PTSD PC-PTSD Screen to determine cases of PTSD. 6.2%. 9.1% of the Soldiers reported ≥ 3 symptoms at Time 1 and Time 2, respectively. A score of ≥ 3 on the PC-PTSD has a specificity of nearly .90 and sensitivity of over .70 (Bliese et al., 2006) that translates to a score of 30 to 34 on the PCL. Bliese et. al (2006) argued that a PCL cut off score at 30 to 34 offers optimal efficiency for screenings in primary care and post deployment settings. The Milliken et al. study (2007) found twice as many soldiers met the cut off score of ≥ 3 PTSD symptoms at the six-month assessment than immediately returning from deployment. Their study also supported the view that early posttraumatic symptomatology is transient in nature; the study found that 59.2% of soldiers who initially reported ≥ 3 PTSD symptoms reported improvement at six months. An interesting finding was that symptom improvement was not related to treatment. In fact, soldiers who did not go to an appointment after being referred to treatment at Time 1 had the highest rate of recovery. This study did not report other findings related to the variables in the current study.

Bliese, Wright, Thomas, Adler and Hoge (2007) had a similar result in the change of PTSD prevalence rates in soldiers after an OIF deployment. They reported significant increases in PTSD rates from 2.98 % immediately after the deployment, to 8.42 % at 120

days' post deployment. In addition to PTSD, this study also measured change in depression and general psychological distress, and included a three-item anger scale validated by the authors, a single yes-no response item that asked soldiers whether they were experiencing a relationship problem, and one yes-no response item about wanting to speak with a counselor. The most commonly indicated symptoms at the 120-day screening were anger and relationship problems.

Army researchers (Cabrera, et al., 2007) surveyed 2392 active duty soldiers three months after returning from Iraq in 2004. They collected data on adverse childhood experiences, depression, PTSD and combat exposure data. Prevalence rates for PTSD in this sample were 13.5%. The study assessed combat exposure with a 29-item list of events that commonly occur in a war zone. Results showed odds ratios for this steadily rose from 1.6 to 4.9 as a function of combat exposure. Younger soldiers, age 18-24, had a significantly higher rate of PTSD than did soldiers age 30-39, 14.7% versus 9.6%. The data in this study show childhood adversity was a higher predictor of mental health symptoms than combat exposure. Odds ratios for three ACEs were 3.63 and ≥ 4 ACEs was 4.90.

A 2008 study (Bliese et al.) reported findings on the diagnostic efficiency of the PC-PTSD and PCL as clinical screening tools with soldiers after a deployment. The data showed that soldiers mean scores on the PCL were 10 points lower when assessed in a clinical setting versus surveillance settings. The authors suggested the anonymity in the latter likely resulted in higher scores in surveillance settings. They recommended using

lower screening scores in the latter setting. They also noted that the PCL performed best in the 30-34 point range for diagnostic efficiency. Table 1 includes information from two of the most recent meta-analyses of research on PTSD risk factors to provide readers a fuller context for interpreting PTSD risk factors.

Table 1

PSS and PTSD Risk Factors and Effect Sizes from Meta-analyses

Brewin et al. 2000		Ozer et al. 2003	
Predictor	R ²	Predictor	R ²
Gender	0	History of Prior trauma	0.17
Younger age	0.14	Psychological problems prior to target stressor	0.17
Low SES	0.12	Psychopathology in FOO	0.17
Lack of education	0.15	Perceived life threat	0.26
Low Intelligence	0.18	Perceived support following trauma	-0.28
Race	0.11	Peritraumatic emotional responses	0.26
Psychiatric history	0.14	Peritraumatic dissociation	0.35
Childhood abuse	0.25		
Other previous trauma	0.14		
Other adverse childhood	0.27		
Family psych. History	0.13		
Trauma severity	0.26		
Lack of social support	0.43		
Life stress	0.31		

Note. R² s in the table are weighted. R² s reported from Brewin et al. 2000 from military samples.

PTSD Prevalence, PSS and Adult Attachment

This section is limited to studies that assessed adult attachment styles and PTSD with self-report measures similar to ones used in this study. Four subsections include studies involving war veterans, soldiers, civilians exposed to war trauma, and high-risk professionals. The concluding subsection offers information related to adult attachment and PTSD from a study using a nationally representative sample of the U.S. population.

Prisoners of War (POWs) and Combat Veterans

The literature reviewed in this subsection is limited to investigations that examined the relationship between adult attachment and PTSD or PSS among military personnel exposed to potentially traumatic war-related events. The relationship between adult attachment measured by self-report and PTSD has been examined among former POWs and/or combat veterans who were members of the United States Armed Forces (Dieperink, Leskela, Thuras, & Engdahl, 2001; Ghafoori, Hierholzer, Howsepian, & Boardman, 2008) and the Israeli Defense Forces (IDF) (Solomon, Ginzburg, Mikulincer, Neria, & Ohry, 1998; Zakin, Solomon, & Neria, 2003; Dekel, Solomon, Ginzburg, & Neria, 2004; Solomon, Dekel, & Mikulincer, 2008). These studies are reviewed in chronological order.

Solomon, Ginzburg, Mikulincer, Neria, and Ohry (1998) used a retrospective design with former IDF POW's adjustment 18 years after their war experience. Study design matched controls to examine the affect of attachment styles on coping during captivity and long-term adjustment. The dependent variables in this study included PTSD

symptom severity and intrusion and avoidance symptoms. Group differences were found between the POWs and Controls on overall PTSD symptoms and intrusion and avoidance symptoms. Attachment styles (secure, avoidant, ambivalent) also provided a main effect for these variables. Post hoc tests revealed that veterans classified as both avoidant and ambivalent attachment reported more overall PTSD symptoms, and stronger war-related intrusion and avoidance symptoms. There were no significant differences found on the study variables for former POWs and controls classified as secure. Among controls, attachment style did not produce a significant effect on these variables. Solomon et al. also examined the relationships between attachment styles and dependent measures related to experiences of captivity among the former-POWs in this study. They found significant effects for feelings of helplessness and abandonment but not death wishes or active fighting for attachment style. Post hoc tests indicated that persons with an avoidant style reported more feelings of helplessness than secure or ambivalent, and persons with an ambivalent style reported more feelings of abandonment by the Army than persons with secure. Subjective suffering neared statistical significance ($p < 0.06$), and post hoc tests showed ambivalent experienced greater suffering than secure or avoidant. The investigators found significant statistical differences for main effects on attachment styles and ways of coping and emotional states for active coping and losing control and animosity towards the Army. Post hoc tests indicated that secure used more active coping during captivity than ambivalent or avoidant persons. Former POWs with an ambivalent style reported more feelings of losing control during captivity than secure or avoidant.

Persons with either an ambivalent or avoidant style reported more anger toward the Army than persons with a secure attachment style. In their discussion, Solomon et al. posited that attachment style may have a direct influence on immediate and long-term reactions to adversity and trauma.

Dieperink, Leskela, Thuras, and Engdahl (2001) obtained survey responses from 107 of 156 U.S. POWs living in the upper Midwest several years after their World War II or Korean War time experiences. The mean age of respondents at capture was 22.6 ± 3.3 years and at assessment was 75.4 ± 3.5 years. The average length of capture for this sample was 17.0 ± 14.5 months. These researchers examined the relationship between adult attachment styles measured with the RQ and ECR. PTSD was measured by the PCL-military version. Attachment anxiety and avoidance dimension scores from the ECR were not used in the analyses for this study. Rather, the investigators used the ECR to calculate the four prototypes and used these scores to provide a concurrent validity check of the RQ. Trauma severity and weight loss during captivity were included as covariates. PTSD cases were calculated using the cluster method according to the DSM-IV diagnostic criteria. Dieperink et al. (2001) grouped participants who reported an insecure attachment style (dismissive, preoccupied, or fearful) into one insecure category for their RQ analyses. 65% of POWs were classified as insecure and 35% were classified as secure. There was a significant difference in the number of cases of PTSD for the insecure and secure participants, 42% versus 10.8% and overall PCL score. Insecurely classified POWs also had higher scores on all symptom subscales, and these were

significantly different from the lower scores of the secure POWs. The researchers also found significant differences among veterans classified as preoccupied, fearful, and dismissive versus those classified as secure. Further, combat exposure and weight loss significantly predicted the prevalence of PTSD. In regression analyses, the insecure attachment variable was a stronger predictor of PTSD symptoms than combat exposure and weight loss during captivity. When investigators used a categorical measure of insecure attachment in a logistic regression, insecure attachment and weight loss during captivity were predictors of PTSD diagnosis. POWs with an insecure attachment were 5.8 times more likely to have PTSD than POWs with a secure attachment.

Zakin, Solomon, and Neria (2003) examined the independent and combined effects of hardiness, attachment style, and wartime prison conditions on PTSD symptoms in the past, present, and psychiatric symptoms of anxiety, depression and somatization in 189 Israeli Defense Forces (IDF) POWs and the same number of combat veteran controls from the 1973 Yom Kippur war. Attachment styles were assessed by a tripartite model (secure, avoidant, anxious). A significant difference was found between the two groups on the distribution of styles. POWs were classified 68% secure, 23% avoidant, and 9% anxious. Controls were classified 79%, 15%, and 6%, respectively. Given the small number of insecurely attached among control group the researchers combined them into one insecure category. Hierarchical regressions including independent variables, group (POW versus controls), attachment (secure versus insecure), and hardiness (continuous measure) were significant for all dependent measures. Contributions to the variance of

distress were from high to low: hardiness, attachment, and group. In both secure and insecure groups hardiness was inversely related to distress but stronger in the insecure group.

Dekel, Solomon, Ginzburg, and Neria (2004) used a three typology model of general attachment style to examine attachment and long-term adjustment of three groups [combat stress reaction (CSR) casualties, recipients of medals for bravery, and controls who neither received medals nor were treated for CSR] of Israeli veterans who fought in the 1973 Yom Kippur War. In all groups, anxious and avoidant attachment styles were associated with more PTSD symptoms. CSR casualties suffered higher levels of PTSD symptoms in the past and attachment styles explained 5.9 % of the variance, with only avoidant attachment significantly contributing. CSR casualties had more current PTSD symptoms than other two groups, with both anxious and avoidant styles explaining 4.7% of the variance.

Ghafoori, Hierholzer, Howsepian, and Boardman (2008) examined the association between adult attachment and PTSD severity with in a convenience sample of 102 U.S. combat veterans who received services at a California Veterans Healthcare center and local veteran centers. In addition to examining the relationship between general adult attachment and PTSD severity with the Relationship Style Questionnaire (Griffin & Bartholomew, 1994) this study sought to identify specific attachment relationships (i.e., parental, intimate partner, and God) that may offer healing to trauma exposed veterans. The study also examined the relative contribution that demographic variables and combat

exposure accounted for PTSD severity. Ghafoori et al. used the Clinician-Administered PTSD Scale (CAPS; Blake et al., 1998) as a continuous measure of PTSD severity. PTSD cases were based on a cutoff score of 65. This review focuses only on their findings related to general attachment styles and PTSD. Ghafoori et al. combined the insecure attachment styles (i.e., fearful, dismissing, and preoccupied) into one group labeled insecure. This re-grouping of the data prevents comparisons with other studies that retain the scores that reflect variability between the three insecure groups. In this sample, 49% meet criteria for current PTSD. In the overall sample, higher scores on secure attachment were negatively related to higher levels of PTSD symptoms and higher scores of insecure attachment were positively related to higher PTSD symptoms. Insecure attachment explained 17% of the variance of current PTSD severity when study data were analyzed in a hierarchical regression with race, education, age, and level of combat exposure.

Solomon, Dekel, and Mikulincer (2008) examined the changes in attachment styles and PTSD in two groups (103 former POWs and 106 controls) of Israeli veterans of the 1973 Yom Kippur war. Data from the same participants, collected in 1991 and 2003, were used in the study. Solomon et al. assessed adult attachment in this study with an instrument similar to the ECR (Brennan, Clark, & Shaver, 1998) and PTSD symptoms were assessed with the PTSD inventory (Solomon et al., 1993) using the cluster method in the DSM-IV. Investigators found former POWs reported more PTSD symptoms overall and for each cluster than controls at both periods. Former POWs also reported significantly different increases from the controls in both attachment anxiety and

avoidance. Solomon et al. (2008) performed two cross-lagged correlations to examine whether PTSD at Time 1 was predictive of attachment orientations and whether attachment orientations at Time 1 were predictive of PTSD symptoms. This analysis revealed that the prospective association going from PTSD at Time 1 to both attachment anxiety and avoidance at Time 2 was significantly stronger than the reverse (i.e., going from attachment anxiety and avoidance at Time 1 to PTSD at Time 2). Solomon et al. noted that these findings could not be explained by adult attachment theory that proposed insecure attachment styles are risk factors for the development and increase of PTSD symptoms but not in the opposite direction. It seems this interpretation misrepresents Mikulincer and Shaver's (2007a) views about attachment processes and psychopathology. Mikulincer and Shaver stated that attachment insecurity and psychopathology are not likely unidirectional, "The causal pathway is likely to be bidirectional. Although attachment insecurities can contribute to psychological disorders, mental afflictions can also exacerbate attachment insecurity and lead to more severe attachment-system dysfunctions" (p. 373).

Civilians Exposed to War-related Attacks and Acts of Terrorism

Mikulincer, Florian and Weller (1993) examined attachment related differences in the severity of posttraumatic stress symptoms in young Israeli adults threatened with Scud missile attacks during the 1991 Gulf War. When compared to participants with a secure attachment style, participants with an anxious style reported more intrusion and

avoidance symptoms. Participants with avoidant style reported more avoidance symptoms.

Mikulincer, Horesh, Eilati, and Kotler (1999) examined the relationship between adult attachment style and PTSD and posttraumatic stress symptomatology in a group of Israeli Jewish settlers living within a Palestine Authority territory and Jewish persons living within the State of Israel. The settlers (high-threat) scored higher on all symptomatology than residents in the State of Israel (control). The study found the predicted associations between attachment and PTSD. Secure attachment style and anxious-ambivalent style were related to posttraumatic symptomatology for both groups negatively and positively, respectively, and no significant difference in the strength of the correlation was found between the two groups. The avoidant attachment was positively associated with PTSD and avoidance in the high-threat group only and not with intrusion scores on the Impact of Event Scale (Horowitz, Wilner, & Alvarez, 1979). Attachment styles and threat conditions made unique and significant contributions respectively to PTSD, IES intrusion and avoidance 32.1%, 36%, and 26.1% and 6.7%, 8.2%, and 9.8%. As indicated, attachment explained a higher percentage of the variance than threat condition.

Fraley, Fazzari, Bonanno and Dekel (2006) examined the relationship between individual differences in adult attachment and psychological adaptation in a sample of individuals in or within blocks of the World Trade Center on September 11, 2001. Repeated measures permitted within-person modeling of symptoms along with between-

person analyses. The study found that persons with low scores on attachment anxiety and avoidance had relatively modest initial PTSD symptoms that decreased across time. At both time points, symptom levels were lower with attachment anxiety and avoidance than with preoccupied, dismissing, and fearful patterns of attachment. Contrary to other studies, persons with dismissing type had symptom levels as high as the symptoms of preoccupied persons. This study also gathered friend and relative reports about the study participant's adjustment before the attack, from attack to seven months later (Time 1), and 18 months later (Time 2). Friends and relatives considered prototypically secure people to be better adjusted than most people before the attack. Prototypically secure people displayed an even higher adjustment level at Time 1 then returned to their pre-adjustment level at Time 2. Prototypically preoccupied people were considered poorly adjusted before the terrorist attack, more poorly adjusted at Time 1 and back to pre-adjustment level at Time 2. Prototypically dismissing people were considered poorly adjusted before, no change at Time 1 and back to pre-adjustment level at Time 2. Results for prototypically fearful people were surprising because family or friends considered them better off than most before, no change at Time 1 and back to pre-adjustment at Time 2.

Mikulincer et al. (2006) reported results from a prospective study examining the relationship between adult attachment and stress responses among Israeli civilians before and during the initial days of OIF in 2003. Investigators obtained baseline measures of general adult attachment before the war then correlated the measures with participants' intrusion and avoidance symptoms for 21 days during the war. Additionally, they

examined participants' context specific feelings of attachment security during the same 21 days. Findings supported an association between global attachment insecurity and more severe war-related symptoms, with intrusion symptoms seen more in anxiously attached individuals and avoidance symptoms seen more in avoidantly attached individuals. Findings also showed that contextual activation of attachment security weakened the intrusion and avoidance symptoms of that day and the next for persons with global anxious attachment but not for persons with avoidant attachment.

Besser, Neria and Haynes (2009) examined individual differences in adult attachment dimensions (anxiety and avoidance), perceived stress, and PTSD among a representative sample of Israeli adults with ongoing exposure (OGE) to mortar and rocket attacks compared to a group with no exposure (NE). Investigators did not find significant group differences for gender, age, or education but the OGE group reported significantly higher levels of PTSD symptoms, perceived stress, and insecure attachment anxiety and avoidance. Bivariate associations showed that being a woman, having attachment anxiety and having attachment avoidance were associated with perceived stress and PTSD. Less education was associated with more PTSD symptoms. A forward step-wise hierarchical regression was used to test whether perceived stress moderates the relationship between exposure and PTSD symptoms. This analysis found attachment anxiety but not avoidance positively associated with PTSD beyond effects of gender, age, low education, and direct exposure. Perceived stress scores also significantly predicted PTSD symptom scores. Exposure x perceived stress was the only two-way interaction predicting symptoms and

none of the three way interactions was significant. Levels of perceived stress were significantly associated with PTSD symptoms as a function of exposure (i.e., among OGE group members but not NE members). Investigators also tested whether under OGE, perceived stress mediates the relationship between insecure attachment and PTSD symptoms. Analyses supported this mediation model for attachment anxiety and PTSD symptoms. Besser et al. proposed findings from this study additionally suggest that ongoing exposure to trauma may affect internal working models and these may affect individual's perception of subsequent traumatic events. They posited that chronic exposure could lead to chronic activation of secondary attachment strategies that result in higher levels of attachment anxiety and avoidance that will remain even after exposure declines. They further interpreted their findings as corroborating a model that higher threat appraisals by persons with higher levels of insecure attachment may be the mechanism associated with the development of psychopathology.

High-risk Professionals

Investigators (Declercq & Palmans, 2006; Declercq & Willemssen, 2006) recently examined adult attachment and PTSD in 544 workers for a security company and Belgian Red Cross. The study included the four styles of attachment and dimensions of anxiety and avoidance as predictors of PTSD. In the four-type model, preoccupied and fearful avoidant styles were significantly associated with a clinical score of PTSD. This four-type model explained 8-12% of the variance and correctly classified 79% of the cases. In

the dimensional model, anxiety but not avoidance predicted a clinical score of PTSD and explained 7-11% of the variance. The model correctly classified 81% of cases.

Declercq and Willemssen (2006) investigated the moderating role of perception of social support and adult attachment style between a critical incident and PTSD in security and Red Cross workers. The study supported their prediction that individuals who perceive social support according to their needs would be less likely to have PTSD. Specifically, lack of social support and negative interactions were more associated with PTSD than a surplus of social support. Predictions that perception of social support would be associated with attachment styles was supported with the findings that secure attached individuals perceived social support as optimal but insecure-fearful avoidant and insecure-preoccupied did not.

Adult Attachment and PTSD in a Nationally Representative U.S. Sample

Over a decade ago, Mickelson, Kessler and Shaver (1997) examined adult attachment study in a nationally representative United States sample to explore theoretical correlates in five broad classes. PTSD was included in the adult psychopathology classes examined. The distributions of adult attachment styles based on the tripartite typology were 59% secure, 11% anxious, and 25% avoidant. In the three style attachment model, PTSD and all other psychiatric disorders, except schizophrenia, alcohol abuse, and drug abuse, were negatively related to secure and positively related to anxious and avoidant attachment.

Summary

The number of published studies that included posttraumatic stress or PTSD as outcome measures with this population group was small. Four of seven studies focused on PTSD assessment issues. Two examined the psychometrics and validity of screening instruments for at risk soldiers (e.g., Bliese et al., 2006, 2008); one identified the change in PTSD prevalence rates at different screening times (Bliese et al., 2007); one identified different prevalence rates on the same instrument in different settings (Bliese et al., 2008). Milliken et al. (2007) reported the change in prevalence of PTSD between assessments. One study reported a PTSD prevalence rate, but its focus was neuropsychological outcomes (Vasterling et al., 2006). The earliest study in the group, Hoge et al. (2004) reported increased rates of mental health difficulties and identified various combat experiences as risk factors of PTSD. Only one study focused on a pre-deployment factor as a risk factor for PTSD. Cabrera et al. (2007) examined the effects of adverse childhood experiences (ACE) as a predictor of PTSD. They found ACE were a stronger predictor of PTSD than combat exposure.

The literature reviewed in the second section of this chapter included three population groups exposed to war-related trauma: combat veterans, POWs, and civilians. Two studies were included in the review from professionals in occupations at high exposure to traumatic events. A nationally representative U.S. sample that included adult attachment was also included. Across all the studies, attachment insecurity and insecure adult attachment styles were related to increased prevalence or posttraumatic stress

severity relative to secure adult attachment style. Similar to other PTSD risk factor research, the majority of the studies used data collected retrospectively.

The most recent study found that adult attachment insecurity was a greater predictor of PSS than combat exposure. Mikulincer et al. (2006) reports results from a prospective study that examined the effects of exposure to war-related threats on Israeli civilians during the initial days of war in Iraq in 2003. Findings in this study showed individuals with higher attachment anxiety had higher intrusion symptoms and those higher in attachment avoidance had higher avoidance symptoms. A key finding in this study was contextual activation of attachment security was efficacious in weakening intrusion and avoidance symptoms in individuals with higher anxious attachment but not those with higher attachment avoidance. Results from studies with high risk professionals found attachment anxiety but not attachment avoidance predicted a clinical score of PTSD. These studies also examined perception of support by attachment style. Individuals with a secure style perceived social support according to their needs but individuals high on the anxiety dimension did not.

Mickelson, et al. (1997) examined adult attachment and various correlates in a nationally representative sample of the U.S. population. The psychopathology items included PTSD. The distribution of attachment styles for this population was: 59% secure, 11% anxious, and 25% avoidant. The lifetime prevalence rate for PTSD in the sample was 7.82%. Anxious and Avoidant attachment styles had higher associations than the secure attachment style.

CHAPTER III

METHODOLOGY

This study analyzed data collected from a sample of active component U.S. Army soldiers six months after they returned from a deployment to Iraq. 1316 soldiers who consented to be in the study, were given a large survey that included two adult attachment instruments, the RQ and the ECR-Short Form. 742 soldiers provided valid responses to the RQ, and 759 soldiers provided valid responses to the ECR-Short Form. 737 soldiers completed all items included in the multiple regression. This chapter describes (a) the source of data for the study, (b) descriptions of instruments used, and (c) the data analysis strategy used to test study hypotheses.

Source of Data

This study used data received from the Walter Reed Army Institute of Research (WRAIR) through an educational partnership agreement with Texas Woman's University. Data analyzed for this study were part of the Land Combat Study 2: Impact of deployment and combat experiences on the mental health and well-being of military service members and their families (LCS2). The LCS2 is a paper-and-pencil survey administered to large groups of soldiers. The survey includes core items and instruments that are planned for use in all data collections and non-core items and instruments that are introduced at specific sites to address issues unique to that location or needed for additional scientific clarification. The LCS2 is a multi-year, multi-site, population based

investigation being conducted by researchers at Walter Reed Army Institute of Research (WRAIR). During the period from October 2008 to October 2013, researchers expect to collect data from 70,000 soldiers and 10,000 spouses.

In June 2009, for the first time, the LCS2 survey included two instruments that assessed adult attachment in soldiers: Relationship Questionnaire (RQ) (Bartholomew & Horowitz, 1991) and Experiences in Close Relationships – Short Form (ECR-Short form) (Wei et. al, 2007). Since the LCS2 also included the PCL, this made it possible to test hypotheses that adult attachment predicts posttraumatic stress (i.e., severity and PTSD prevalence) in this population sample. This study tested hypotheses with both adult attachment instruments. Table 2 shows the variable name and the source of data for each variable used in this study. Designated appendices provide snapshots of survey items.

Data analyzed for this study was collected from soldiers assigned to an active duty Army Brigade Combat Team (n=3172), approximately six months after the unit returned from a 15 month tour in Iraq. During the data collection period, 2379 soldiers were available to attend a recruitment briefing (i.e., not in training, sick, etc.), 1586 soldiers attended the recruitment briefing, and 1316 of these soldiers gave consent for participation in the research. This gave a study response rate of 55.3% (1316/2379).

Table 2

Variables and the Source of Data for the Study

Variable Name	Source of Data
Attachment style	See Appendix C: RQ Attachment styles in following order: Secure, preoccupied, fearful avoidant, dismissing avoidant.
Attachment Anxiety	See Appendix D: ECR-Short form Attachment anxiety = 2, 4, 6, 8R, 10, 12.
Attachment Avoidance	See Appendix D: ECR-Short form Attachment avoidance = 1R, 3, 5R, 7, 9R, 11.
PTSD	See Appendix E: PCL. Scoring described in text.
PSS	See Appendix E: PCL. Sum of all items.
Intrusion symptom severity	See Appendix E: PCL. Sum of items 1-5.
Avoidance symptom severity	See Appendix E: PCL. Sum of items 6-12.
Sex	See Appendix F.
Age	See Appendix F.
Civilian education	See Appendix F.
Perceived danger of injury or death	See Appendix G. Score 0 – 399 provided to the question: How many times during your most recent deployment did you believe you were in serious danger of being injured or killed?
Combat exposure and experiences	Appendix H. 34 items recoded to ‘never’ or ‘once or more’.
Index Trauma	See Appendix I.
A2 criteria	See Appendix J.

The study included only the data provided by soldiers who participated in the unit’s recent deployment to Iraq and provided valid scores on the main instruments. Exploratory data analysis identified 1072 soldiers who participated in the recent deployment to Iraq. Data cleansing was performed on this stratum of data to eliminate cases with inaccurate or inconsistent responses on the dependent and predictor variables. The original data were further reduced to include only soldiers who answered all 17 items

on the PCL, one and only one response on the Relationship Questionnaire (RQ) (Bartholomew & Horowitz, 1991), and all 12 items on the Experiences in Close Relationships – Short Form (ECR-Short form) (Wei et. al, 2007). Further reductions were made for the ECR-Short form. The data were reduced to exclude soldiers who responded with a ‘1’ or ‘strongly disagree’ response on all 12 items on the ECR-Short form. Since this instrument includes reverse scored items, a straight lined response pattern suggested non-deliberated responses. The data also were reduced to exclude soldiers who responded with a ‘4’ or ‘neutral’ response on all 12 items on the ECR-Short form. Since attachment anxiety and avoidance are underlying dimensions for the four styles on the RQ, a neutral or ambiguous response pattern on the ECR-Short form is inconsistent with the forced selection made on the RQ. Cases with non-informative responses on the ECR-Short form were removed from the data set so soldiers who provided responses on the ECR-Short form that could also be recoded to an attachment style were included in the analysis. These data cleansing actions yielded a sample of 742 soldiers for data analyses with the RQ and 759 soldiers for analyses with the ECR-Short form.

Instrumentation and Design

Independent (Predictor) Variables

The RQ (Appendix C) is a short instrument with four multi-sentence paragraphs that correspond to the four attachment styles: secure, preoccupied, fearful avoidant, and dismissing avoidant. These paragraphs are repeated in two questions. In the first question, respondents are asked to circle the paragraph that, “best describes you or the way you are

in close relationships”. In the second question, respondents are asked to, “rate each of the following relationship styles according to the *extent* to which you think each description corresponds to your general relationship style,” on a 7-point Likert scale from: “Not at all like me” to “Very much like me.” The RQ was designed to get a continuous rating on each of the four styles. However, the LCS2 included only the first question of the RQ.

The ECR-Short form (Appendix D) is a 12-item instrument that measures the two dimensions of attachment anxiety and attachment avoidance. This instrument includes six items for each dimension from the widely used, highly reliable and valid ECR (Brennan, et al., 1998). The ECR uses 18 items to measure each dimension. Across six studies, the ECR-Short form had a stable factor structure and acceptable internal consistency (.77 to .86 for anxiety subscale and .78 to .88 for avoidance subscale), test-retest (e.g., .82 and .89 for avoidance and anxiety respectively in study six), and construct validity. Coefficient alphas dropped with the reduction of items. Coefficient alphas were .80 for the shorter version and .93 for the original for attachment anxiety, .85 for shorter version and .94 on the original for attachment avoidance. In this study, Cronbach’s alpha for the attachment anxiety and avoidance items were .58 and .73, respectively.

Dependent (Outcome) Variables

The PCL (Appendix E) is a core item on the LCS2. The sum of all items provided a posttraumatic stress severity (PSS) score. The three symptom subscales: intrusion, avoidance, and hyperarousal, also were examined separately. Initial psychometrics were based on a military version of the PCL. Development of the instrument involved Vietnam

veterans with a high prevalence of PTSD. In that sample, internal consistency coefficients for the total scale (.97) and subscales (.92 to .93) were high. Test-retest over 2-3 days was .96. The PCL had good predictive validity with the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID) PTSD module where a cutoff score of 50 had sensitivity of .82, a specificity of .83, and a kappa of .64. PCL-M correlated highly with other PTSD assessment instruments ranging from .77 to .93. The PCL-S (specific version) has shown comparable predictive validity with the Clinician-Administer PTSD scale (CAPS) .93 (Blanchard, Jones-Alexander, Buckley, & Forneris, 1996). Cronbach's alpha for the items on the PCL were highly correlated in this study: total scale was .94 and subscales ranged from .87 to .91.

Probable Sensitive PTSD and Strict PTSD were determined from the PCL by using the diagnostic cluster method. Sensitive PTSD corresponds to the standard cluster method of defining a case and to the "Broad" category used by Hoge et al. (2004). Sensitive PTSD was assigned to cases that met DSM-IV symptom cluster criterion at a moderate level (i.e., item responses of 3-5). A "Strict PTSD" case designation used by Hoge et al. (2004) was used for comparison purposes only in descriptive statistics. Strict PTSD was assigned to cases that met DSM-IV symptom cluster criterion at a moderate level (i.e., item responses of 3-5) and had a score of equal to or greater than 50 on the PCL.

Covariates (Predictors Used in Multiple Regression)

Sex, age, and highest level of civilian education were used as risk factors of posttraumatic stress. Perceived threat of serious injury or death (PD) was assessed by one item that was worded, “How many times during your most recent deployment did you believe you were in serious danger of being injured or killed?” Participants could score this item 0 to 399.

Combat exposure and experiences (Appendix F) were assessed by 34 items that began with the question “How often did you experience the following during the most recent deployment?” Participants responded on a Likert-type scale: 1 = “never” to 5 = “five or more times”. In this study, these items were recorded into the two categories of “never” or “once or more” (see the scoring method in a recent study by Cabrera et al., 2007). The recoded data were summed to make the combat exposure variable (range 0-34). A higher score would indicate more combat exposure and combat experiences.

Ancillary Items

This study performed descriptive statistics on two additional items included in the LCS2. Both items contribute additional information about posttraumatic stress reported by the soldiers. The first item relays information about the origin or the context associated with the soldier's current posttraumatic stress. The second item relays information about soldiers' subjective distress at the time of the potentially traumatic event (i.e., peritraumatic distress). In the survey, soldiers were asked to identify the source of their symptoms reported on the PCL. Recent investigations about the

prevalence of PTSD and posttraumatic stress severity among OIF/OEF soldiers have not reported whether current symptoms are associated with a trauma or traumas experienced on the recent deployment or another period.

The second item points to the intensity of the stress experience. Soldiers were asked whether “intense fear, helplessness, or horror” was experienced at the time of a potentially traumatic event. The DSM-IV requires a positive response to this question in order to meet the subjective diagnostic criteria for PTSD in the DSM-IV. This “A2” criterion has been criticized on several grounds (for a summary of this discussion see Kirkpatrick, Resnick, & Acierno, 2009). The DSM-V work group has proposed eliminating this criterion. The prevalence of PTSD by the A2 criteria was examined for descriptive purposes only in this study.

Analysis of Data

Descriptive statistics were used to summarize information about the sample. Frequencies and percentages were used to describe data at the nominal level (e.g., age, rank, prevalence of PTSD) and ordinal (e.g., combat experiences) levels. Means and standard deviations were used to summarize interval data (e.g., posttraumatic stress severity and symptom scores). Chi-square tests of independence were used to evaluate the effect of attachment style on the prevalence of PTSD. Results were reported in odds ratios. Analyses of variance were performed to determine mean differences in posttraumatic stress outcomes between soldiers grouped by adult attachment styles. Linear Regression, a statistical procedure used to predict a score for a dependent variable

from an independent variable when the latter is expressed at the interval level, was used to predict PSS from attachment related anxiety and avoidance. The effects of the predictors were expressed as regression coefficients. The Multiple Regression/Correlation (MRC) system is an ideal analytic approach to address the complexities of data found in the behavioral sciences (i.e., the multiplicity and correlation of potential factors, information in varied form, shape of the data, and conditional relationships between variables) (Cohen & Cohen, 1983). Multiple Linear Regressions were performed to examine variance of adult attachment anxiety and avoidance with other risk factors as predictors of PSS. Demographic variables were dummy-coded so they could be used in the regression model.

Two attachment measures, RQ and ECR-Short form, were used in this study to test whether adult attachment predicted PTSD and PSS among U.S. soldiers. Hypothesis testing for the RQ was conducted first because it included nominal data that are weaker than the ECR-Short form's interval data. The specific analysis plans for each measure is described below.

Attachment Styles (RQ) as Predictors of PTSD and PSS

First, the Cross tabulation or Contingency table with Pearson's chi-square test statistic was used to test whether soldiers with different attachment styles report different frequencies of PTSD. Odds ratios were calculated for each attachment style.

Second, analyses of variance (ANOVA) were performed to determine if there were mean differences in posttraumatic stress severity and attachment style. Scheffe HSD

post hoc tests were performed to determine the differences between the attachment styles. Two additional ANOVAs with Scheffe post hoc tests were performed to test theoretical propositions. That is, analyses were performed to determine if insecure attachment styles higher in the avoidance dimension (dismissing and fearful avoidant) predicted higher posttraumatic stress avoidance symptom severity and if attachment styles higher in the attachment anxiety dimension (preoccupied and fearful avoidant) predicted higher posttraumatic intrusion symptoms.

Adult Attachment Anxiety and Avoidance as Predictors of PSS

First, simple linear regressions were performed with attachment anxiety and attachment avoidance as predictors and PSS as the dependent variable. Next, a Hierarchical Multiple Logistic Regression was performed with a model that included frequently examined risk factors for PTSD in soldiers. The model used the simple entry method to input demographic risk factors (i.e. sex, age, and level of education) at step 1, attachment anxiety and avoidance at step 2, perceived danger of injury or death at step 3, combat exposure at step 4.

Adult Attachment Style (ECR-Short Form) and Prevalence of PTSD

Finally, an exploratory analysis was conducted by recoding the two dimensions on the ECR into the four attachment styles that were measured on the RQ. Frequency distribution was performed to determine the distribution of adult attachment styles based on this measurement approach. Cross tabulations with Pearson's chi-square test statistic

were used as before to test whether soldiers with different attachment styles reported different frequencies of PTSD. Odds ratios were calculated for the four attachment styles. All analyses were conducted with SPSS (Version 12 for Windows).

Summary

This study tested theoretical propositions regarding the prediction of PTSD and PSS from adult attachment. Data collected for the LCS2 study were used to build models to predict period prevalence of PTSD and PSS from two adult attachment instruments, the RQ and ECR. This data came from 1316 active component U.S. Army soldiers assigned to a Brigade Combat Team that returned from a deployment to Iraq in the past six months. Data cleansing procedures reduced the data to include only cases with valid responses to key measures. The analysis relied on two instruments that assessed adult attachment and a measure of posttraumatic stress. Analyses using data from the RQ included 742 soldiers. Analyses using data from the ECR Short-form included 759 soldiers for linear regressions and 737 soldiers for multiple regression. Statistical procedures used the .05 level of significance. SPSS statistical software was used to analyze the data.

Frequencies and percentages were used to describe demographic and other data measured at the nominal level. Means and standard deviations were used to summarize data collected at interval data (e.g., posttraumatic stress severity and symptom scores).

Using the RQ data, the Contingency table with Pearson's chi-square test statistic was used to test whether soldiers with different attachment styles report different

frequencies of PTSD. Odds ratios were calculated for the four attachment styles. Then, to determine if there were mean differences in total PSS and symptom clusters and attachment style, ANOVAs with Scheffe post hoc tests were calculated.

Using data from the ECR-Short form, simple linear regressions were calculated to examine how well adult attachment anxiety and avoidance predicted PSS. Next, a multiple regression model that included only attachment anxiety and avoidance was performed to examine the collective effect of adult attachment anxiety and avoidance on PSS. Finally, a hierarchical regression was performed to test the effect of attachment anxiety and avoidance when examined with other predictors for PTSD. Since the effect size of a variable can change dramatically according to its position in the hierarchical regression, another hierarchical regression was performed with perceived danger of injury or death and combat exposure in a superior position in the hierarchy to adult attachment anxiety and avoidance.

Finally, the continuous data for attachment dimensions obtained from the ECR-Short form was re-coded to the same four styles examined on the RQ. Soldiers' distribution of attachment styles and prevalence of sensitive PTSD by attachment style were computed.

CHAPTER IV

RESULTS

This chapter is divided into three sections: description of the sample, hypotheses results, and an exploratory analysis. The first section describes the study sample and presents demographic statistics by prevalence of PSS and sensitive PTSD. The second section report results of hypotheses testing, including results from linear regressions, multiple regression, and hierarchical multiple regression analyses of attachment dimensions as predictors of PSS. The final section reports results of an exploratory analysis of the four attachment styles recoded from the ECR.

Description of the Sample

This section describes the demographic characteristics of the study sample. It includes socio-demographic information, frequency of PTSD, means and standard deviations for PSS, index traumas that soldiers associated with their PSS, and the distribution of adult attachment styles compared to a civilian U.S. nationally representative sample.

Table 3 displays the demographic information for the sample. Approximately 50% of the soldiers in this sample had been in the Army for less than or equal to four years. 15% had been in the Army less than or equal to two years. The percentage of married soldiers in this sample, 58.5%, was comparable to the 59.6% in the total Army in 2009. Of the married soldiers, 54.4% had been married to their current spouse for less than or equal to three years, 26.4% had been married for less than or equal to one year, and 48.5% had one or more children living in their household.

Table 3

Demographic Characteristics of Soldiers

Variable	N	%
Sex		
Male	674	89.9
Female	76	10.1
Age		
18-24	283	37.3
25-29	242	31.9
30-39	185	24.4
40 or older	48	6.3
Highest level of civilian education		
Some high school	2	0.3
High school diploma/GED	332	44.0
Some college/associates degree	320	42.4
Bachelors degree	88	11.7
Graduate degree	12	1.6
Marital Status		
Single never married	230	30.5
Married	441	58.5
Separated	41	5.4
Divorced	38	5.0
Widowed	2	0.3
Missing	2	0.3
Children living in household		
None	381	51.5
1 or more	359	48.5
Rank		
Enlisted 1-4	366	48.5
Enlisted 5-9	319	42.3
Officer/Warrant Officer	70	9.3

The prevalence of sensitive PTSD and strict PTSD reported by the Third Infantry Division (3ID) soldiers in this sample was 13.4% and 10.4%, respectively. These rates are lower than the 18.0% and 12.9% reported in a 2003 sample (Hoge et al., 2004). Table 4 reports the frequencies for the prevalence of sensitive PTSD by demographic variables.

Table 4

Demographic Characteristics by Prevalence of Sensitive PTSD

Variable	Sensitive PTSD				Analysis		
	No		Yes		X ²	df	P
	N	%	N	%			
Sex							
Male	582	86.4	92	13.6			
Female	66	86.8	10	13.2	0.014	1	.906
Age							
18-24	233	82.3	50	17.7			
25-29	209	86.4	33	13.6			
30-39	172	93	13	7			
40 or older	42	87.5	6	12.5	10.92	3	.012
Highest level of civilian education							
Some high school	2	100	0	0			
High school diploma/GED	281	84.6	51	15.4			
Some college/associates degree	282	88.1	38	11.9			
Bachelors degree	79	89.8	9	10.2			
Graduate degree	10	83.3	2	16.7	2.94 _a	4	.568

(continued)

Table 4 *Demographic Characteristics by Prevalence of Sensitive PTSD (continued)*

Variable	Sensitive PTSD				Analysis		
	No		Yes		X ²	df	P
	N	%	N	%			
Marital Status							
Single never married	196	85.2	34	14.8			
Married	392	88.9	49	11.1			
Separated	32	78	9	22			
Divorced	30	78.9	8	21.1			
Widowed	2	100	0	0			
Missing	1	50	1	50	9.49 _a	5	.091
Children in household							
None	322	84.5	59	15.5			
1 or more	320	89.1	39	10.9			
Missing	15	78.9	4	21.1	4.37 _a	2	.113
Rank							
Enlisted 1-4	306	83.6	60	16.4			
Enlisted 5-9	282	88.4	37	11.6			
Officer/Warrant Officer	65	92.9	5	7.1	6.03	2	.049

Note. Common subscripts indicate variables had less than the needed 5 cases per cell to perform the Chi-square analysis.

Chi-square tests were performed to assess whether soldiers with the various demographic characteristics had an equal frequency of sensitive PTSD. Two variables, age and rank, had significant relationships with PTSD. The data show a trend towards increased risk with younger age with the exception of the over 40-year-old group. Greater risk of PTSD was consistently associated lower rank. Table 5 reports the means and standard deviations for posttraumatic stress severity (i.e., total score on the PCL) by attachment style. ANOVAs did not find statistically significant differences in PSS differences and demographic variables.

Previous studies that report on the prevalence of PTSD among OIF/OEF veterans after a recent deployment have not noted whether soldiers' current symptoms are associated with a potentially traumatic event experienced during that deployment or whether soldiers associate their current symptoms with an earlier event and setting. The current study includes this information in Table 6. The data show that an almost equal number of soldiers reported that their current symptoms resulted from a stressful event on a recent deployment as those who reported that they did not have any stressful experience to relate to their current symptoms. An interesting finding was that soldiers who indicated that they did not have any stressful experience had a higher frequency of PTSD than soldiers who reported that their symptoms were associated with an event from the recent deployment. The remaining soldiers attributed their current symptoms to earlier events and contexts. The frequency of PTSD among soldiers in these groups was the same as soldiers with PTSD from a previous deployment but higher for soldiers who attributed their symptoms to events that happened in either military but non-deployment and non-military settings.

Table 5

Demographic Characteristics by Posttraumatic Stress Severity

Variable	Posttraumatic Stress Severity			Analysis		
	N	Mean	SD	F	df	p
Sex						
Male	674	29.9	14			
Female	76	32	15.5	1.46	748	0.227
Age						
18-24	283	31.5	15			
25-29	242	29.4	13.5			
30-39	185	29	13.1			
40 or older	48	29.5	15	1.5	754	0.214
Highest level of civilian education						
Some high school	2	31	19.8			
High school diploma/GED	332	30.3	14.2			
Some college/associates degree	320	30	13.9			
Bachelors degree	88	28.4	12.9			
Graduate degree	12	33.6	19.2	5.35	749	0.71
Marital Status						
Single never married	230	30.3	14.7			
Married	441	29.3	13.7			
Separated	41	34.6	13.7			
Divorced	38	32.3	15			
Widowed	2	38	17			
Missing	2	28	15.6	1.46	748	0.199
Children in household						
None						
1 or more						
Missing						
Rank						
Enlisted 1-4	366	30.9	14.9			
Enlisted 5-9	319	29.8	13.3			
Officer/Warrant Officer	70	26.9	13.1	2.46	752	0.086

Table 6

Frequency and Percentage of Index Trauma by PSS and Prevalence of Sensitive PTSD

Variable	Posttraumatic Stress Severity		Sensitive PTSD			
	N	Mean	No		Yes	
			N	%	N	%
Index Trauma						
Recent deployment	243	29.1	215	88.5	28	11.5
Previous deployment	61	29.8	54	88.5	7	11.5
Military non-deployment	48	34.5	41	85.4	7	14.6
Non-military	64	32.2	51	79.7	13	20.3
No trauma	263	29.6	228	86.7	35	13.3

Nearly 40% of soldiers who provided responses to all PCL items did not respond to whether or not they had a stressful experience that included intense fear, helplessness or horror that would have met the A2 criterion for PTSD. Sensitive PTSD among non-responders was 5.1%. Among respondents who did respond, the overall prevalence of sensitive PTSD was 18.6%. 12.9% of soldiers who did not have this kind of experience met criteria for sensitive PTSD, and 33.3% of soldiers who reported that they had this kind of experience also had sensitive PTSD.

Table 7 shows soldiers distributions according to the four attachment styles measured by the RQ and aggregated distributions for a three style or a secure versus insecure adult attachment typology. Taken as a whole, 59.6% of the soldiers reported insecure adult attachment typology. The three and two style typologies were computed from the insecure attachment styles. The three and two style typologies were computed from the data to compare the results in this study with the literature that has reported the other

typologies. For example, Table 7 shows the prevalence of soldiers with insecure attachment in this sample was significantly higher ($p < .000$, Fishers Exact Test) than the 40.3% civilians who reported insecure styles in a U.S. nationally representative sample (Mickelson, Kessler, & Shaver, 1997). This large proportion of soldiers with insecure attachment styles was also higher than the proportion of research participants with insecure styles in other non-clinical and clinical samples in the literature on adult attachment and PTSD. These comparisons are not reported in this study.

Table 7

Distribution of Adult Attachment Styles of Soldiers Compared to Nationally Representative Civilian Sample

	Soldiers		Civilian Reference Group	
	N	%	N	%
Four Types				
Secure	300	40.4		
Preoccupied	160	21.6		
Fearful Avoidant	55	7.4		
Dismissing Avoidant	227	30.6		
Three Types				
Secure	300	40.4	2270.0	56.8
Anxious	160	21.6	432.0	10.8
Avoidant	282	38	1103.0	27.6
Two Types				
Secure	300	40.4		
Insecure	442	59.6		

Note. Distribution based on male subset of a nationally representative sample; N=3997. Reference group percentages do not equal 100% because 4.8% of the sample was unclassified. Test of Significance was performed with the sum of anxious and avoidant cells. An adjusted rate for those who reported insecure attachment styles was 40.3% when unclassified participants were removed from the calculation.

Results of Analyses

Hypothesis 1: Soldiers with insecure attachment styles (preoccupied, fearful avoidant, or dismissing avoidant) will have a statistically significant higher prevalence of PTSD than soldiers with a secure attachment style.

There was a statistically significant difference in the frequencies of PTSD according to attachment style: $\chi^2(742) = 29.64, p < .05$. Expected and observed frequencies of the presence and absence of sensitive PTSD and odds ratios are presented in Table 8. Over or nearly 25% of soldiers who reported a preoccupied or fearful avoidant style, respectively, met the criteria for sensitive PTSD. By contrast, only 6% of soldiers who reported a secure attachment style met the criteria for sensitive PTSD.

Table 8

Expected and Observed Frequencies and Prevalence of Negative and Positive Cases of Sensitive PTSD by Attachment Style and Odds Ratios

Attachment Style	Sensitive PTSD			
	No		Yes	
	N		N	
	Expected/Observed	%	Expected/Observed	%
Secure	260/282	94	40/18	6
Preoccupied	139/119	74.4	21/41	25.6
Fearful Avoidant	48/42	76.4	7/13	23.6
Dismissing Avoidant	197/200	88.1	30/27	11.9
	Odds ratio		95% CI	
Secure	0.2845		[0.1668, 0.4852]	
Preoccupied	3.1127		[1.9913, 4.8657]	
Fearful Avoidant	2.1631		[1.1159, 4.1928]	
Dismissing Avoidant	0.8306		[0.5117, 1.3327]	

Hypothesis 2: Soldiers with insecure attachment styles will have a statistically significant higher PSS than soldiers with a secure attachment style. Preoccupied and fearful avoidant will have statistically significant higher PSS than secure and dismissing avoidant.

A one-way ANOVA was calculated with PSS as the dependent variable and attachment styles as the independent variables. Table 9 presents the means and SDs. There was a statistically significant difference between attachment style and PSS. Since the assumption of homogeneity of variance was violated, the Welch F-ratio is reported; $F(3, 203.76) = 31.57, p < .000$. Post hoc analyses using Scheffe criterion for significance indicated that PSS was higher for all three insecure styles than the Secure style, the Preoccupied and Fearful Avoidant styles were higher than the Dismissing Avoidant style but not statistically significantly different than each other. The hypothesis that insecure attachment would predict higher PSS was supported.

Two additional one-way ANOVAs were performed to test theoretical propositions that soldiers with more anxious attachment styles (preoccupied or fearful avoidant) would have more intrusion symptoms than soldiers with a less anxious attachment style (secure and dismissing avoidant), and soldiers with more avoidant attachment styles (fearful avoidant or dismissing avoidant) would have more avoidant symptoms than soldiers with a less avoidant attachment style (secure and preoccupied).

Table 9

Mean and SD for PSS Total Score and Cluster Scores by Attachment Style (RQ)

	Secure N=300		Preoccupied N=160		Fearful Avoidant N=55		Dismissing Avoidant N=227	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
PSS (PCL)								
Total score	25.09	10.80	37.06	15.34	36.02	15.88	30.18	14.00
Subscales								
Intrusion	7.19	3.58	9.60	5.09	9.75	5.17	8.12	4.40
Avoidance	9.41	4.11	14.62	6.50	13.98	6.83	11.90	6.13
Hyperarousal	8.49	4.31	12.84	5.65	12.29	5.82	10.16	5.23

Hypothesis 3: Soldiers with preoccupied and fearful avoidant attachment styles will have statistically significant higher intrusion symptom severity than soldiers with secure or dismissing avoidant attachment styles.

An ANOVA was calculated with intrusion as the dependent variable and attachment style as the independent variable. There was a statistically significant difference between attachment style and intrusion. Since the assumption of homogeneity of variance was violated, the Welch F-ratio is reported; $F(3, 204.10) = 12.30, p < .000$. Post hoc analyses using Scheffe criterion for significance indicated that soldiers with Preoccupied and Fearful Avoidant styles had statistically significant more intrusion symptom severity than soldiers with a secure attachment style. Soldiers with a preoccupied style but not Fearful Avoidant style had statistically more intrusion symptom severity than soldiers with a Dismissing Avoidant style. This hypothesis was supported.

Hypothesis 4: Soldiers with fearful avoidant and dismissing avoidant attachment styles will have statistically significant higher avoidance symptom severity than soldiers with secure and preoccupied attachment styles.

An ANOVA was calculated with avoidance as the dependent variable and attachment style as the independent variable. There was a statistically significant difference between attachment style and avoidance. The assumption of homogeneity of variance was violated again in the sample, so the Welch F-ratio is reported; $F(3, 199.75) = 36.10, p < .000$. Post hoc analyses using Scheffe criterion for significance indicated that soldiers with all three insecure attachment styles had statistically significant more avoidance symptom severity than soldiers with a secure attachment style. Results only partially supported the hypothesis because soldiers with a preoccupied style, although low on attachment avoidance, had the highest avoidance symptom severity for all groups.

Hypothesis 5: Higher attachment anxiety will be a statistically significant predictor of higher PSS.

Hypothesis 6: Higher attachment avoidance will be a statistically significant predictor of higher PSS.

Bivariate linear regression was performed for each attachment dimension to test if both predict PSS. A .05 criterion of statistical significance was used. The linear regression showed adult attachment anxiety predicted nearly 10 % of the variance in PSS ($R^2 = .09, p < .05$). The linear regression show adult attachment avoidance predict a greater amount of the variance of PSS ($R^2 = .17, p < .05$).

A multiple linear regression was performed using simultaneous entry method to determine the collective effect of adult attachment dimensions, anxiety and avoidance, on soldiers' PSS. The results of the regression indicated the two predictors explained 20.3% of the variance of PSS, and the overall effect for the model was significant, $F(2, 756) = 96.4$, $p > .000$, with a moderate $R = .451$. Attachment avoidance was the most influential predictor ($\beta = .35$, $p < .000$) followed by attachment anxiety ($\beta = .20$, $p < .000$). Based on the results shown in Table 10, the regression formula for predicted PSS would be the following: $PSS = 4.405 + .424 (\text{Attachment Anxiety score}) + .839 (\text{Attachment Avoidance score})$.

Table 10

Adult Attachment Dimensions as Predictors of PSS

Variable	Posttraumatic Stress Severity		
	<i>B</i>	SE	95% CI
Constant	4.405*	1.905	[.665, 8.146]
Attachment Anxiety	0.424**	0.071	[.285, .562]
Attachment Avoidance	0.839**	0.08	[.681, .997]
R^2	0.20		
F	96.41**		

Note. N = 759. SE = Standard Error. CI = Confidence Interval. * $p > .05$. ** $p > .001$.

Hypothesis 7: Attachment anxiety and attachment avoidance will account for a statistically significant amount of variance in PSS beyond other risk factors.

Another Hierarchical Multiple Linear Regression was performed with additional risk factors of PTSD entered into the model to determine if adult attachment dimensions predict PSS above the variance predicted by the new predictors. This hierarchical regression used a conservative sequencing of predictors (Cohen & Cohen, 1983). The model used the simple entry method to enter sex, age, and level of education at step 1, attachment anxiety and avoidance at step 2, perceived danger at step 3, and combat exposure at step 4. This cumulative R^2 series assumes adult attachment dimensions have a causal priority in the developmental course of posttraumatic stress that precedes the effects of war zone factors: perceived danger of injury or death and combat exposure.

Table 11 shows that soldiers' adult attachment dimensions accounted for the majority of the variance of PSS. Adult attachment had three times the effect size of combat exposure, an objective measure of stress, and seven times the effect size of perceived danger of injury or death, a subjective measure of stress. Table 12 shows the correlation coefficients, standard error, and 95 % confidence intervals for the model. Consistent with the literature, the effect of demographic variables on PSS were negligible. In this study, being female was a significant risk factor $p < .003$ and being 25-29 years old approached significance $p = .064$. The multiple regression formula for this

analysis takes the form: Predicted PSS = 0.194 + 4.455(Female) + -2.014(Age 25-29) + -1.070(Age 30-39) + -0.593(Age 40 over) + 2.90(Not HS grad) + 0.339(Some college) + 0.696(College degree) + 4.613(Graduate degree) + .0425(Attachment Anxiety) + 0.738(Attachment Avoidance) + 0.010(Perceived danger of injury or death) + 0.538(Combat Exposure).

Table 11

Change in R² for Hierarchical Multiple Regression Model Predicting PSS from Demographics, Adult Attachment Dimensions, Perceived Danger, and Combat Exposure

Predictor	Posttraumatic Stress Severity
	ΔR^2
Step 1	.010
Demographic variables ^a	
Step 2	.20*
Attachment Anxiety	
Attachment Avoidance	
Step 3	.03*
Perceived danger of injury or death	
Step 4	.07*
Combat exposure	
Total R ²	.31*
n = 737	

Note. ^aDemographic predictors included: Edu_Grad_Degree, Edu_Not_HS_Grad, Edu_College_Grad, Age_40_over, Sex, Age_30_39, Edu_Some_College, Age_25_29. Edu = Highest level of civilian education. Edu_HS_Grad was the reference group for highest level of education. Being male was the reference group for Sex. Age_18_24 was reference group for Age groups. *p < .001.

Table 12

Coefficients for Hierarchical Regression Model Predicting PSS from Demographics, Adult Attachment Dimensions, Perceived Danger, and Combat Exposure

Variable	Posttraumatic Stress Severity		
	<i>B</i>	SE	95% CI
(Constant)	0.194	2.04	[-3.817 -4.206]
Female	4.455	1.50	[1.508 -7.402]
Age_25_29	-2.014	1.09	[-4.146 - 0.117]
Age_30_39	-1.070	1.18	[-3.392 -1.253]
Age_40_over	-0.593	1.91	[-4.334 -3.148]
Edu_Not_HS_Grad	2.900	8.38	[13.547- 19.347]
Edu_Some_College	0.339	0.99	[-1.599 -2.278]
Edu_College_Grad	0.696	1.51	[-2.277 - 3.668]
Edu_Grad_Degree	4.613	3.54	[-2.336 -11.561]
Attachment Anxiety	0.425	0.07	[0.292 -0.557]
Attachment Avoidance	0.738	0.08	[0.587 -0.890]
Perceived danger of injury or death	0.010	0.00	[0.002 -0.018]
Combat Exposure	0.538	0.06	[0.416 -0.659]
Total $R^2 = .31$			
$n = 737$			

Note. SE = Standard Error. CI = Confidence Interval. * $p < .05$. ** $p < .001$.

Since the increment of change attributable to a predictor may vary considerably based upon its position in the hierarchy (Cohen, 1988) another hierarchical analysis was performed with perceived danger of injury or death and combat exposure in a superior position relative to attachment dimensions. Table 13 shows changing the order of predictors made small changes in their effect sizes. Adult attachment remained the strongest predictor of PSS. Table 14 shows coefficients, standard errors, and 95 % confidence errors for the alternate model. The multiple regression formula for this

alternate analysis had the same values for the variables as the earlier model, so the formula was not restated.

Table 13

Change in R^2 for Hierarchical Multiple Regression Model Predicting PSS from Demographics, Perceived Danger, Combat Exposure, and Adult Attachment Dimensions

Predictor	Posttraumatic Stress Severity
	ΔR^2
Step 1	.010
Demographic variables ^a	
Step 2	.04*
Perceived danger of injury or death	
Step 3	.10*
Combat exposure	
Step 4	.17*
Attachment Anxiety	
Attachment Avoidance	
Total R^2	.31*
n = 737	

Note. ^aDemographic predictors included: Edu_Grad_Degree, Edu_Not_HS_Grad, Edu_College_Grad, Age_40_over, Sex, Age_30_39, Edu_Some_College, Age_25_29. Edu = Highest level of civilian education. Edu_HS_Grad was the reference group for highest level of education. Being male was the reference group for Sex. Age_18_24 was reference group for Age groups. *p < .001.

Table 14

Coefficients for Hierarchical Regression Model Predicting PSS from Demographics, Perceived Danger, Combat Exposure, and Adult Attachment Dimensions

Variable	Posttraumatic Stress Severity		
	B	SE	95% CI
(Constant)	0.194	2.04	[-3.817- 4.206]
Sex	4.455	1.50	[1.508- 7.402]
Age_25_29	-2.014	1.09	[-4.146- 0.117]
Age_30_39	-1.070	1.18	[-3.392-1.253]
Age_40_over	-0.593	1.91	[-4.334- 3.148]
Edu_Not_HS_Grad	2.900	8.38	[-13.547- 19.347]
Edu_Some_College	0.339	0.99	[-1.599- 2.278]
Edu_College_Grad	0.696	1.51	[-2.277- 3.668]
Edu_Grad_Degree	4.613	3.54	[-2.336- 11.561]
Perceived danger of injury or death	0.010	0.00	[0.002- 0.018]
Combat Exposure	0.538	0.06	[0.416-0.659]
Attachment Anxiety	0.425	0.07	[0.292- 0.557]
Attachment Avoidance	0.738	0.08	[0.587- 0.890]
Total R ² = .31			
n = 737			

Note. SE = Standard Error. CI = Confidence Interval. *p < .05. **p < .001.

Exploratory Analysis of Attachment Styles Assessed with ECR as Predictors of PTSD

The two dimensions on the ECR were used to compute the four attachment styles measured on the RQ. Reducing the continuous measurement of the two attachment dimensions into a four style typology like the RQ resulted in fewer soldiers with insecure attachment styles, 50.9% versus 59.6%. The secure category increased from 40.4% to 49.0%, preoccupied decreased from 21% to 13.4%, fearful avoidant increased from 7.4% to 11.3%, and dismissing avoidant decreased from 30.6% to 26.2%.

Mikulincer and Shaver (2007a) suggest data from the two dimensions fit well with other studies when rotated 45-degrees. Data from the dimensions were not rotated for this analysis. Further, analysis is needed to assess convergence between the RQ and ECR-Short form. Table 15 shows prevalence of PTSD by attachment style using data from the ECR-Short form in its raw form.

There was a statistically significant difference in the frequencies of PTSD according to attachment style: $\chi^2(759) = 82.37, p < .05$. Table 15 presents the expected and observed frequencies of the presence and absence of sensitive PTSD and odds ratios. The cross tabulation of attachment styles and PTSD outcomes show that the prevalence of PTSD in soldiers with an insecure attachment style was 3 to 9 times higher than the prevalence in soldiers with a secure attachment style.

Secure adult attachment was a strong protective factor for PTSD, and insecure attachment was a risk factor for PTSD. Secure attachment was a protective factor for 96.2% of soldiers as measured by ECR-Short Form and 94% as measured by the RQ. Among insecure styles, this data showed a different pattern of positive cases of PTSD when compared to the RQ. In the former, soldiers who endorsed a dismissing avoidant style had an odds ratio of .8306. When computed from the ECR, the odds ratio for the dismissing avoidant style is 2.5786. This change in odds ratios is similar for the preoccupied attachment style but in reverse order: The odds ratio for preoccupied went down from 3.1127 to .84.

Table 15

Expected and Observed Frequencies and Prevalence of Negative and Positive Cases of Sensitive PTSD by Attachment Style (ECR) and Odds Ratios

Attachment Style	Sensitive PTSD			
	No		Yes	
	N		N	
	Expected/Observed	%	Expected/Observed	%
Secure	322/358	96.2	50/14	3.8
Preoccupied	88.3/90	88.2	13.7/12	11.8
Fearful Avoidant	74.4/55	64.0	11.6/31	36.0
Dismissing Avoidant	172.3/154	77.4	26.7/45	22.6
	Odds ratio		95% CI	
Secure	0.1329		[0.0741, 0.2384]	
Preoccupied	.84		[.442, 1.5964]	
Fearful Avoidant	3.1913		[1.9214, 5.3005]	
Dismissing Avoidant	2.5786		[1.6765, 3.966]	

Summary

This chapter presented the descriptive statistics from the study sample, results from hypotheses testing, and exploratory analysis of the four attachment styles recoded from the ECR. Data showed soldiers were predominately male (89.9%), young (18-29 years, 69.2%), mostly high school graduates (44%) or with some college/ associate degree (42.4%) and mostly married (58.5%) or single (30.5%). Approximately 50% of soldiers had been in the Army less than four years. Less than 10 % of the soldiers were commissioned officers; the majority was either junior enlisted (48.5%) or non-commissioned officers (42.3%).

The prevalence of sensitive PTSD and strict PTSD among the soldiers was 13.4% and 10.4%, respectively. Prevalence of sensitive PTSD was related statistically

significantly to younger age and lower rank. An exception to the decreased frequency of PTSD as a function of increased age was found in the over 40-age group.

29.1% of soldiers indicated that the source of their PSS came from a stressful event experienced during their most recent deployment. A slightly larger percentage (29.6%) indicated that they had not experienced a stressful event. However, the latter group had a higher rate of sensitive PTSD than the former, 13.3% versus 11.5%.

A notable descriptive statistic was the high rate of insecure adult attachment found in this convenience sample of US soldiers. According to responses on the RQ, 59.6% of soldiers had insecure attachment styles. This percent of insecure attachment was statistically significantly higher than the frequency of insecure attachment in a nationally representative sample and in other military samples in the literature.

The study used data from two adult attachment instruments, RQ and ECR, and a measure of posttraumatic stress symptoms, the PCL, to test study hypotheses. Analyses of the nominal data from the RQ and the continuous data from the ECR supported theoretically derived hypotheses suggesting that insecure attachment is a risk factor for PTSD and PSS in U.S Army soldiers. Conversely, results supported the notion that secure adult attachment is a protective factor for PTSD and PSS. A summary of all directional hypotheses are reported in Table 16.

There were statistically significant differences in the frequencies of PTSD according to attachment style: $\chi^2(742) = 40.32, p < .05$. Hypothesis 1 was supported by a lower odds ratio for soldiers with secure attachment style .2845 compared to the odds ratios of soldiers with insecure attachment styles that ranged from .8306 – 3.1127.

An ANOVA was performed to determine if there was a statistically significant difference in PSS between attachment style groups. A main effect of attachment style was

found for PSS, $F(3, 203.76) = 31.57, p < .001$. Post hoc analyses showed PSS was higher for soldiers with any insecure style than for soldiers with a secure attachment style. The data supported hypothesis 2.

Hypotheses 3 and 4 were calculated with intrusion and avoidance symptoms as dependent variables to test whether adult attachment styles predicted posttraumatic processes. Hypothesis 3 was fully supported: $F(3, 204.10) = 12.30, p < .000$. Soldiers with attachment styles associated with a higher anxiety dimension, preoccupied and fearful avoidant had significantly more intrusion symptoms than soldiers with secure and dismissing avoidant styles. Hypothesis 4 was also fully supported: $F(3, 1999.75) = 36.10, p < .000$. Soldiers with an attachment styles associated with a higher avoidance dimension, fearful avoidant and dismissing avoidant, had significantly higher avoidance symptoms than soldiers with a secure attachment. However, soldiers with a preoccupied attachment, a style not associated with higher attachment avoidance, had the most avoidance symptoms.

Simple and multiple regressions were performed using ECR data. Regression analyses for Hypotheses 5 and 6 showed both dimensions were statistically significant predictors of PSS, $R^2 = .09$ and $.17$, respectively. A multiple regression model that included only attachment anxiety and avoidance accounted for 20.3% of variance in PSS. In a fuller multiple hierarchical regression analysis which included adult attachment dimensions and other risk factors, the data showed negligible, non-significant effects for a set of demographic variables, significant and a relatively moderate effect size, $.21$, for dimensions of adult attachment, anxiety and avoidance, and small effect sizes $.03$ and $.07$, respectively, for war zone factors, perceived danger of injury or death and combat exposure. A reduced hierarchical multiple regression model was tested with only adult

attachment and combat exposure because of their relatively higher Standardized Beta Coefficients. This reduced model accounted for 29% of variance in PSS when either adult attachment or combat exposure was entered in the superior position in the regression sequence. In either case, adult attachment accounted for a larger amount of the variance in PSS, 20% or 18%. The data supported hypothesis 7.

Finally, an exploratory analysis was performed on the data from the ECR-Short form after it was coded as the four attachment styles assessed by the RQ. Several differences between these results and results from the RQ are notable. First, the frequency of secure attachment styles among soldiers increased by almost 10%. Second, cross tabulations of attachment style by PTSD showed that the prevalence of PTSD in soldiers with an insecure attachment style was 3 to 9 times higher than in soldiers with a secure attachment style. This is a marked increase from the 2 to 3 time higher rate found in the RQ. This increase is primarily a factor of the lower rate of PTSD among soldiers with a secure attachment. In the ECR, that rate fell to 3.8% from the 6% in the RQ. Third, the ECR analysis revealed higher and lower odds ratios for the dismissing avoidant and preoccupied attachment styles, respectively.

Table 16

Summary of Directional Hypotheses Testing

H1: Soldiers with insecure attachment styles (preoccupied, fearful avoidant, or dismissing avoidant) will have a statistically significant higher prevalence of PTSD than soldiers with a secure attachment style. Supported

H2: Soldiers with insecure attachment styles will have a statistically significant higher PSS than soldiers with a secure attachment style. Supported
Preoccupied and fearful avoidant will have statistically significant higher PSS than secure and dismissing avoidant.

H3: Soldiers with preoccupied and fearful avoidant attachment styles will have statistically significant higher intrusion symptom severity than soldiers with secure or dismissing avoidant attachment styles. Supported

H4: Soldiers with fearful avoidant and dismissing avoidant attachment styles will have statistically significant higher avoidance symptom severity than soldiers with secure and preoccupied attachment styles. Partially Supported

H 5: Higher attachment anxiety will be a statistically significant predictor of higher PSS. Supported

H 6: Higher attachment avoidance will be a statistically significant predictor of higher PSS. Supported

H7: Attachment anxiety and attachment avoidance will account for a statistically significant amount of variance in PSS beyond other risk factors Supported

CHAPTER V

DISCUSSION

This chapter includes a discussion of the study results, implications drawn from the study, recommendations to the Army, and summary. The discussion of the results includes comments on the demographics of the study sample and on the findings from this study.

Discussion of the Study Results

The demographic data presented in this study showed that a high number of soldiers are married and have children in their households. The data also showed that most soldiers had been married to their current spouse for a relatively short time, 54.4% less than or equal to three years and 26.4% less than or equal to one year. Since insecure attachment style is associated with less perceived social support, married soldiers with an insecure attachment may not experience support from their spouse when a spouse provides support. Soldiers' perceived lack of adequate spousal support may contribute to increased marital conflict. Given these factors, marriage for soldiers with insecure attachments may provide a less than optimal post-deployment recovery environment. The short marital history suggests that many soldiers are still in the process of transferring attachment functions to their spouse. The length of marriage and the pairing of couples by attachment style will also influence the quality of the relational environment for both partners.

The descriptive data also highlights the fact that many soldiers are parents with children in the household. In the cases where Army children have soldier-parents with an insecure attachment style, those Army children may not get the level of attention and sensitivity they need from their soldier-parent. If the soldier-parent is a single parent or if the soldier's spouse also has an insecure attachment style, the child's parenting environment will likely lack the amount of sensitive, available and responsive interactions the child needs for optimal social-emotional development.

Findings from the RQ and PCL are similar to earlier studies that found insecure attachment styles were associated with a higher prevalence of PTSD. The prevalence of PTSD among soldiers with an insecure attachment style (n=442) was 18.3% compared to 6% among soldiers with a secure attachment style (n=300). When the soldiers in the insecure attachment group was compared to the soldiers in the secure group, the insecure group had an odds ratio of 3.5152 (CI of 95 % = 2.0609, 5.9958). This rate was higher than the rate that Hoge et al. (2004) reported for being wounded (3.21) and approached the rate of a history of ≥ 3 Adverse Child Experiences (ACE) 3.63 (Cabrera et al., 2007). The rates for each specific insecure style had a lower odds ratio, but soldiers with a preoccupied style approached a rate associated with ≥ 3 ACE. Cabrera et al. (2007) included a risk factor for PTSD that was associated with adverse childhood experiences. Maunder and Hunter (2001, 2008) reviewed the literature on adverse childhood experiences and concluded that disrupted secure attachments and impaired stress responses rather than the adversity, increased risk of disease.

Study findings were also consistent with earlier studies that found that insecure attachment styles were significantly related to higher total symptom severity and symptom processes (i.e., specific attachment styles were related to the specific symptom clusters, intrusion and avoidance symptoms). Findings that styles higher on the anxiety dimension (i.e., preoccupied and fearful avoidant) had higher intrusion scores than secure and dismissing avoidant were consistent with earlier studies (Mikulincer et al., 1993, 1999). Findings that styles higher on avoidance dimension (i.e., dismissing avoidant and fearful avoidant) would have higher scores on avoidance symptom severity than secure and preoccupied were supported only partially because preoccupied had the highest avoidance symptoms. This finding is consistent with the developmental course of posttraumatic stress symptoms that initially involves intrusion symptoms followed by avoidance symptoms. Since individuals with a preoccupied style have hyper-activating strategies prone to intrusion, it follows that the course would continue to include avoidance symptoms.

Key findings from the ECR-Short form emerged from the hierarchical multiple regressions performed in the study. These findings were similar to those by Ghafoori et al. (2008) who found adult attachment explained more of the variance of PSS than combat exposure, 17% for attachment and 13% for combat exposure. The hierarchical regression in this study that entered attachment dimensions in the last position, below combat exposure in the hierarchy, demonstrated that the attachment dimensions contributed 17% and combat exposure contributed 10% of the variance of PSS. However,

this order does not give the attachment dimensions the temporal and causal priority that theory assigns to this factor. When attachment anxiety and avoidance are given causal priority consistent with attachment theory, they contribute 20% and combat exposure contributes 7% to the variance of PSS.

Another key finding from the hierarchical regression was that being female predicted higher PSS. To my knowledge, this is first study to report sex differences for increased risk of PSS for women soldiers deployed to Iraq. No statically significant differences were found between men and women on the attachment dimensions. These findings are in contrast with Rona, Fear, Hull, and Wessely (2007) who reported no statistically significant differences by sex for members of the United Kingdom's Armed Forces who deployed to combat in Iraq. Rona et al. used a scale of their own making to obtain a score on Post-traumatic Stress Reaction and the PCL. They reported no sex differences based on the former but did not report results from the PCL. Rona et al. reported no increased risk for the prevalence of PTSD for women based on the PCL. Since their endpoint was prevalence of PTSD rather than PSS, their statistical results cannot be compared directly with findings from this study.

The influence of perceived threat of danger or injury had less power to predict PSS than the $R^2 = .25$ reported by Ozer et al. (2004). Measurement variability may account for the difference. This study measured perceived danger based on responses to one item that ranged from 0-399. A recent study (Kolkow, Spira, Morse & Grieger, 2007) found that Army Reserve health care providers who reported frequent concern about

threats were 8.87 times at greater risk of meeting probable PTSD criteria. Kolkow et al.'s study used a nominal scale which collapsed the data into two categories (i.e., frequently and anything less than that).

Finally, the exploratory analysis of ECR-Short form is comes with a caution because data was not rotated. A 45-degree rotation of the two dimensions would be required to fit well with the data in other studies (Mikulincer & Shaver, 2007a). The literature does not report a similar use of the ECR-Short form. Theoretically, the two dimensions create represent the four dimensional space. Data will need to be rotated to properly assess the convergent validity between the RQ and ECR-Short form.

Implications

This study argued that modern attachment theory is an excellent theoretical framework for PTSD research with U.S. Army soldiers. In addition, attachment theory has broad implications for soldier research and training. This section outlines the potential impact of attachment theory in the following areas: medical research, soldier human dimension research, leadership, comprehensive fitness, posttraumatic growth, and counseling.

Army medical research may benefit from incorporating attachment theory to address mental health and other areas of medicine. The psychological and psychopathological processes that develop from early experiences of inter-personal trauma contribute to psychopathology generally rather than one specific clinical syndrome. Literature reviewed in this study, (e.g., Mikulincer et al., 1993; Mickelson et

al., 1997) have supported a positive relationship between insecure attachment style and other mental health (e.g., anxiety, depression) and health (e.g., somatization) conditions. Attachment theory is also relevant to Army medicine beyond mental health. There is a burgeoning body of medical research examining the relationship between attachment processes and somatization, pain, health risk behaviors, health care utilization, and other areas of medicine. Army medical research using attachment theory to understand these issues could benefit soldiers, Army families, and the Army.

Two research topics of concern in the Army that may benefit from an attachment perspective are health care utilization and pain. The Army has made significant efforts to dispel stigma about mental health problems since Hoge et al. (2004) reported on the issue. Army efforts to build a culture of support for psychological health have focused on efforts to dispel stigma at the organizational level. Finding from a recent study suggest these efforts have made a difference (Wright et al., 2009). Although individual differences in attachment behavior or support seeking are well established, no research has examined this aspect of health care utilization and mental health problems in soldiers. Theoretically, changes in the Army caregiving environment will lead support seeking by soldiers with higher attachment avoidance who have a general disposition not to seek help. Including attachment theory in the study of soldier health care utilization for mental health problems would address individual variability and better explain soldier help seeking behavior. Pain research is another major medical concern in the Army that can benefit from attachment research (e.g., see Meredith, Ownsworth, & Strong's, 2008, for a

review of the literature and their attachment-diathesis model of chronic pain). Keefe, Porter and Labban (2006) reviewed the efficacy of partner-based approaches to pain management and concluded that attachment styles will have implications for partner-based approaches. These and other reports suggest that attachment theory could inform Army medical research on pain.

Psychosomatic medicine can provide useful conceptual frameworks for future studies on health and disease to Army medical researchers. For example, Maunder and Hunter (2001) proposed a model that explains how insecure attachment contributes to disease through three pathways and their related mechanisms. Pathway 1 is insecure attachment and stress regulation. They suggested insecure attachment might affect individual differences in stress response by increasing perceived stress, intensity and duration of stress response, and the buffering effect of social support. Pathway 2 involves the use of external behavioral affect regulation strategies (e.g., substance abuse, eating, and sexual behavior) to compensate for deficits in internal affect regulation. Pathway 3 involves the failure or nonuse of protective factors, including treatment adherence and symptom reporting.

The implications of attachment theory go beyond Army medicine to address the Army human dimension and capabilities development. The U.S. Army human dimension study (2008, April) found that components of the human dimension, cognitive, physical, and moral/social, have not been adequately included and integrated into soldier research. The Army (2008, June) approved the human dimension concept and proposed an

increased focus on the human dimension across the soldiers' life cycle. Attachment is a developmental and organizational construct that can inform science and technology initiatives related to the human dimension. The same biological and psychological processes associated with attachment, health, and diseases are involved in implementing soldiers' cognitive, social and interpersonal behaviors and capabilities. Modern attachment theory can inform interdisciplinary soldier research across levels of analysis and advance knowledge about the human dimension and operational adaptability.

The National Research Council, at the request of the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) (ASAALT), conducted a study of neuroscience and its potential to support military applications (Committee on Opportunities in Neuroscience for Future Army Applications, 2009). They recommended the Army invest in social neuroscience. This new interdisciplinary field is committed to discovering "how biological systems implement social processes and behavior" (Cacioppo et al., 2007, p. 99). Attachment theory and attachment research are prominent in the history and ongoing development of this field. Coan (2008) has suggested "attachment neuroscience" is an emerging field of its own. The emergence of attachment neuroscience is a logical extension of the multidisciplinary attachment research that preceded it. Attachment theory has stimulated basic research on behavioral and social processes. Topics in this body of literature include attention, learning, memory, sensation and perception, emotion and motivation, social influences and social cognition, close relationships and social networks, and the theory of mind.

Empathy, an important research topic of interest to Army leaders and society, is a topic often investigated in attachment research. The new Army leadership Field Manual 6-22 (U.S. Department of the Army, October 2006) identifies empathy as a core inner quality in Army leaders. The United States Army Research Institute for the Behavioral and Social Sciences has contracted studies that have shown associations between attachment and leadership (e.g., Popper, Amit, Gal, Mishkal-Sinai, & Lisak, 2007). Davidovitz et al. (2007) examined the soldier-leader dyad in the Israeli Defense Forces in three studies that show associations between leaders' attachment styles, motives to lead, and perceived quality of leadership by soldiers. Attachment researchers are also generating applied research related to topics closely related to empathy and leadership. Attachment research has shown attachment based behavioral interventions can boost self-esteem, compassion, altruistic helping, and reduce intergroup hostility (see Mikulincer & Shaver, 2007a, for a review). These findings further illustrate that soldier research on the human dimension could profit from research guided by attachment theory.

Recently, the Army launched the Army Comprehensive Soldier Fitness (CSF) program to increase the resilience of Soldiers and Families and promote growth in five domains: emotional, social, spiritual, family, and physical. Positive psychology has assumed a prominent place in this program. In the first issue of *The Journal of Positive Psychology*, Linley, Joseph, Harrington, and Wood (2006) proposed the positive psychology movement could benefit from investigating positive psychological phenomenon at multiple levels (i.e., biological, psychological, and social). Sheldon

(2009) argued that positive psychology lacks an integrative framework and the “scientific backbone” needed to explain human behavior. Mikulincer and Shaver (2005) have argued similarly that positive psychology lacks a coherent theoretical basis. They suggest that attachment theory provides positive psychology the foundation it needs.

Attachment theory may also provide the CSF program and Army chaplaincy a theoretical framework for soldier and Army family research on the spiritual domain. The idea of God as an attachment figure (Kirkpatrick & Shaver, 1990) has produced considerable literature in the field of psychology of religion. Granqvist, Mikulincer, and Shaver (2010) proposed that attachment theory may be limited in this domain but non-theist religions and spiritualities may have conceptual links. It seems that attachment theory offers the Army a broad umbrella for exploring the development and strengthening of spiritualities of various kinds. Specifically, multi-leveled investigations that explain how diverse spiritual and religious experiences and practices implement behavior and health could make a big contribution.

Literature reviewed in this study suggested secure attachment is associated with posttraumatic growth for individuals with a secure attachment style. Seven months after the World Trade Center attack, highly exposed survivors with secure attachment had even better levels of adjustment than before the attack (Fraley, et al., 2006). Salo, Qouta, and Punamäki (2005) found that secure attachment moderated the effects of high levels of torture and negative emotions and resulted in posttraumatic growth in political

prisoners in Palestine. In addition to the concept of resilience, these studies suggest attachment theory can inform the study of posttraumatic growth.

For decades, attachment theory has informed psychotherapy. Recently, emotionally focused couples therapy (Johnson, Hunsley, Greenberg, & Schindler, 1999) has been in the forefront of helping couples that include one partner with PTSD or history of relational trauma. Shorey and Snyder (2006) reviewed findings in psychotherapy and recommended assessing attachment styles be a standard part of treatment planning. They also suggested attachment styles be part of outcome research to account for individual differences in how persons with different styles perceive support. Literature reviewed in this study found that relationship problems are among soldiers' chief complaints. The impact of posttraumatic stress on marital satisfaction among soldiers and spouses continues to be a concern (Renshaw, Rodrigues, & Jones, 2008). Increasingly, soldiers and family members are requesting couple counseling. Incorporating assessments of attachment styles into Army counseling programs is a way to increase personalized care and services with individuals and couples. Familiarity with help-seekers attachment styles and discussions with help-seekers about perceived support and comfort with closeness may enhance the formation of therapeutic alliances and positive counseling outcomes.

Recommendations

- Include adult attachment items as a core item in future WRAIR LCS2 surveys with soldiers and family members.

- Educate Army leaders and communities of interests about modern attachment theory and its utility for understanding the Human Dimension.
- Include attachment theory in the Army's Human Dimension Strategy.
- Establish cooperative research agreements and encourage collaborations between U.S. Army Research and Development laboratories and leading attachment researchers and university based adult attachment laboratories to accelerate research products to the Army.
- Introduce modern attachment theory and adult attachment measures into the research and assessment efforts of the Comprehensive Soldier Fitness program. Include continuous measures of attachment in the Global Assessment Tool.
- Invest in attachment based research, training, and evaluation in the Military Child and Adolescent Center of Excellence and Child/Youth Services. Optimizing soldiers and Army spouses' attachment related skills and attitudes in the parenting dyad (i.e. safe haven for distress and secure base for exploration) will likely promote positive interpersonal behaviors in other close relationships e.g. marriage, work, and society.
- Incorporate attachment theory into Chaplain Corps concepts and encourage interdisciplinary research on the development and benefits of secure relationships to God or other transcendent realities and values.
- Implement Shorey and Snyder's (2006) recommendations to include attachment style assessments as standard practice in counseling services and initiate

counseling outcome research to validate best practices with individuals and dyads with different attachment styles.

Summary

The discussion of the results of the study highlighted several significant findings. The sample demographics noted two specific areas of concern. First, soldiers with insecure attachment styles may have a distress-promoting marital environment that hinders recovery from post deployment combat stress. Second, the high prevalence of soldier parents and soldiers with insecure attachment styles suggests that some Army children may have less than optimal social-emotional developmental interactions with their soldier-parent.

Findings about the relationship between adult attachment style and probable PTSD and PSS in this study were consistent with earlier research involving war veterans, civilians exposed to war trauma, and high-risk professionals. The findings from the RQ showed that attachment style is a predictor of sensitive PTSD in active component U.S. soldiers. The odds ratio was similar to being wounded and approached the same power as having ≥ 3 adverse childhood events. Findings supported or partial supported hypotheses that attachment styles with higher attachment related avoidance and anxiety would have higher avoidance and intrusion symptom severity, respectively.

Findings from the ECR-Short form were consistent with earlier studies that examined the two dimensions, attachment anxiety and attachment avoidance, as a continuous variable. Each dimension was a statistically significant predictor of PSS. The

key finding was that adult attachment dimensions were stronger predictors of PSS than war zone factors, perceived threat or combat exposure. Adult attachment dimensions entered into the regression prior to combat exposure accounted for nearly three times the variance of PSS over combat exposure, 20% versus 7%. Another key finding in this study contrasted an earlier study (Tolin & Foa, 2006) by finding that women soldiers were at increased risk for higher PSS.

This study suggested that contemporary attachment theory is a useful framework for future PTSD research with U.S. Army soldiers. At the same time, this study argued for a broader use of attachment theory in the Army. These areas include medical research, soldier human dimensions research, leadership, comprehensive fitness, posttraumatic growth, and counseling. Specific recommendations to accelerate the delivery of actionable knowledge through attachment based research and training were proposed.

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APPENDIX A

WRAIR – TWU Education Partnership Agreement

EDUCATION PARTNERSHIP AGREEMENT

BETWEEN

THE WALTER REED ARMY INSTITUTE OF RESEARCH
503 ROBERT GRANT AVENUE
SILVER SPRING, MARYLAND 20910-7500

AND

TEXAS WOMEN'S UNIVERSITY
DEPARTMENT OF FAMILY SCIENCES
P.O. BOX 425769
DENTON, TEXAS 76204

I. Preamble

The United States of America is represented by the Department of the Army, Walter Reed Army Institute of Research (WRAIR), 503 Robert Grant Avenue, Silver Spring, Maryland 20910-7500, and Texas Women's University (TWU), Department of Family Services, P.O. Box 425769, Denton, Texas 76204, (hereinafter referred to as "the Parties") hereby enter into this Education Partnership Agreement (hereinafter referred to as the "Agreement") pursuant to Title 10 United States Code Section 2194. The terms and conditions of this Agreement are set forth as follows.

II. Introduction

The Parties enter this Agreement in recognition of the importance of education to the future and economic well-being of the nation, as well as the importance of WRAIR to universities and colleges in the United States.

As a medical research laboratory, WRAIR has a responsibility to encourage the study of science, biomedical research, and medical engineering at all levels of education. By entering into education partnership agreements with universities and colleges in the United States, WRAIR pursues these goals.

TWU is a notable institution, primarily for women, dedicated to excellence through academic achievement, research and creativity, innovation and collaboration and committed to fiscal accountability.

TWU's academic and social environment empowers students by inspiring intellectual curiosity and lifelong learning, embracing scholarship and research, developing leadership and personal responsibility, and promoting diversity and respect for all individuals. TWU educates students to succeed as they pursue careers, research or graduate study in the liberal arts and sciences and health, education, and business professions. By setting high expectations and high ideals, TWU prepares its graduates to lead personally and professionally fulfilling lives.

III. Authority

Pursuant to the Education Partnership Agreement Act, Title 10 United States Code 2194, for the purpose of encouraging and enhancing science, research, and medical engineering at all levels of education WRAIR is authorized to:

- a. Loan laboratory equipment to TWU.
- b. Transfer laboratory equipment determined by the director to be surplus.
- c. Make laboratory personnel available to teach science courses or to assist in the development of science courses and materials for TWU.
- d. Involve faculty and students in defense laboratory research projects.
- e. Cooperate with TWU in developing a program under which students will be given academic credit for work on defense laboratory research projects.

IV. Objectives

WRAIR's objective for entering into this agreement is to support a retired officer (Robert H. Williams) in obtaining his dissertation, and to advance the department's research goals by leveraging extramural resources to conduct relevant research.

TWU's objective for entering into this agreement is to obtain data for Robert H. Williams' dissertation.

V. Deliverables

WRAIR will provide to TWU a de-identified data set, which will be used primarily by Robert H. Williams (a student at the university) for his doctoral dissertation. The data set will contain the variables applicable to examining the relationships between attachment items, relevant outcomes, and moderators as specified in the dissertation prospectus. The data may also be used for presentations and manuscripts.

TWU will provide to WRAIR findings from the analyses of the data and recommendations for future research directions.

VI. Specific Obligations

- a. TWU agrees to:
 - (1) Be responsible for all University faculty, student, and employee salaries or other compensations and benefits as necessary under this Agreement.
 - (2) Provide research, study and laboratory space for students as necessary for accomplishment of the research project.
 - (3) Provide necessary computer hardware and software for all analysis and report writing relevant to the research project.
 - (4) Provide a safe and secure location to house electronic copies of WRAIR data sets necessary for the completion of the project.
 - (5) Provide academic credit toward requirements of an appropriate degree program for students on working on WRAIR research projects.

- (6) Provide to WRAIR for review copies of all manuscripts, presentations, and/or graduate theses, prior to publication.
 - (7) Be responsible for ensuring Institutional Review Board (IRB) approval is obtained and provide a copy of the approval to WRAIR.
 - (8) Co-author papers and presentations for conferences, peer reviewed journals, and the Defense Technical Information Center.
- b. WRAIR agrees to:
- (1) Be responsible for all WRAIR employee salaries or other compensations and benefits as necessary under this Agreement.
 - (2) Encourage its scientists and staff to provide academic and career advice to University students and faculty.
 - (3) Encourage and support students in their completion of a master's thesis and/or dissertation.
 - (4) Be responsible for obtaining protocol approval and forwarding a copy to the University.
 - (5) Prior to publication, submit all coauthored manuscripts through the appropriate MRMC clearance process.
- c. Subject to Article XIII (Liabilities) below, neither Party shall be obligated to compensate the other Party for costs incurred by the other Party in carrying out activities defined by this Agreement.
- d. Each of the Parties shall direct its own activities pursuant to this Agreement. No Party shall have authority to direct the other's activities.
- e. Any public announcement of this Agreement shall be coordinated between the Parties to include the Associate Science Director for Research, Marketing, and Extramural Programs who oversees public affairs at WRAIR. TWU shall not use the name of WRAIR or Government on any product or service that is directly or indirectly related either to this Agreement or any assignment that implements this Agreement without prior written approval of WRAIR. Similarly, WRAIR shall not use the name of TWU on any product or service that is directly, or indirectly related to this Agreement without prior written approval of the University. By entering into this Agreement, neither Party, directly or indirectly endorses any product or service provided, or to be provided, by the other Party. Neither Party shall in any way imply this Agreement as an endorsement of any such product or service.
- f. Generally, only United States citizens are eligible to be participating faculty or students under this Agreement. Exceptions will be determined by WRAIR on a case-by-case basis.

- g. TWU's faculty and students participating under this Agreement will not be required to obtain security clearances. Research project completion will not require access to classified materials. However, work on certain projects may require University faculty and student(s) access to proprietary information in the possession of WRAIR or information for which export is restricted by the Export Administration Act (Title 50 United States Code Section 2401 et seq.) or otherwise protected from disclosure by statute, executive order, or regulation. In such cases, to obtain access to this information, faculty member and students must comply with the requirements for disclosure contained in the statutes, executive orders, including signing nondisclosure agreements before a disclosure of such information may be made by WRAIR.
- h. The Parties' obligations under this Agreement are contingent upon and subject to availability of funds within their respective organizations.

VII. Benefits

- a. The benefits to TWU, its students and the State of Texas include:
 - (1) A formal vehicle for "real world" data and information exchange and analysis with WRAIR.
 - (2) Opportunities to conduct and disseminate scientific research on soldier post-deployment functioning that has value to WRAIR, to the scientific research community, and to the society as a whole.
 - (3) Access to Department of Defense technologies and information for research and study, and access to computing equipment and databases dedicated to technology transfer that would not otherwise be available.
 - (4) Insight into the Army's future information and research technology needs and objectives.
 - (5) A forum for participants to exchange ideas and information that may lead to teaming arrangements or other formal agreements.
 - (6) Opportunities for further collaboration between the University and WRAIR on various projects that will strengthen overall United States competitiveness.
 - (7) Improved educational relevance to academic programs as a result of closer interaction with WRAIR personnel and research projects based upon practical, "real world" problems and needs.
- b. The benefits to WRAIR and the Army include:
 - (1) Good will.
 - (2) Promoting the education of future scientists and engineers.
 - (3) Enhancing WRAIR scientists, and managers as a result of conducting research in conjunction with academic and practicing professionals.
 - (4) Advancement of the departmental goals to understand soldier post-deployment functioning and to collaborate with extramural researchers.

VIII. Partnership Administration

The Administration of this Agreement and the coordination of specific activities will be the joint responsibility of the designated program managers from WRAIR and TWU.

Dr. Lyndon A. Riviere, Research Psychologist, Military Psychiatry, Psychiatry and Neuroscience, Walter Reed Army Institute of Research, 503 Robert Grant Avenue, Room #2W87, Silver Spring, Maryland 20910; Phone: 301-319-9138; Fax: 301-319-9484; Email: Lyndon.riviere@amedd.army.mil will serve as the Agreement Program Manager on behalf of WRAIR. He will work with the program manager from the University to identify, select, and prioritize the activities in which the Parties engage pursuant to this Agreement and will ensure that the program activities meet the statutory and regulatory requirements of the Federal Government and the Department of the Army.

Lillian Chenoweth, Professor of Family Studies, Texas Women's University, Department of Family Sciences, P.O. Box 425769, Denton, Texas 76204; Phone: 940-206-5127; Fax: 940-898-2976, Email: L.Chenoweth@twu.edu will serve as the Agreement Program Manager on behalf of the TWU. She will work with the program manager for WRAIR to identify, select, and prioritize activities in which the Parties engage pursuant to this Agreement, and will ensure that pro activities meet the statutory and regulatory requirements of the University. Ms. Chenoweth will also serve as TWU's agreement Administrator and work with WRAIR's agreement Administrator Patricia A. Lacey, M.B.A., Administrative Officer, WRAIR, 503 Robert Grant Avenue, Room 1W58, Silver Spring, Maryland 20910, Phone: 301-319-7421, Fax: 301-319-9810, Email: patricia.lacey@amedd.army.mil and will ensure that program activities meet the statutory and regulatory requirements of TWU.

IX. Patents and Copyrights

Due to the nature of work performed, it is not expected that any patentable or copyrightable material will be developed under this Agreement. In the event patentable material is developed under this Agreement, each Party shall separately own any invention made solely by its respective employees under this Agreement. Inventions made jointly by the Parties will be jointly owned by the Parties. Licensing of intellectual property, if any will be set out in separate agreements. In the event copyrightable material is developed under this Agreement, TWU shall own the copyright in all works created in whole or in part by the University and grants in advance to the United States Government a license conveying the right to use, duplicate or disclose such works in any manner, and to have or permit others to do so, for government purposes only.

X. Proprietary Information/Confidential Information

The Parties agree that any proprietary information, or confidential information, furnished by one party to the other party under this Agreement, or in contemplation of this Agreement, shall be used, reproduced and disclosed by the receiving party only for the purpose of carrying out this Agreement, and shall not be released by the receiving party to third parties unless written consent to the release is

obtained from the providing party. *Each party shall place a proprietary or confidential notice on all information it delivers to the other party under this Agreement which it asserts is proprietary or confidential.*

XI. Release Restrictions

WRAIR shall have the right to use all information for any U.S. Governmental purpose, but shall not release information publicly except: (i) WRAIR, in reporting results of sponsored research, may publish information in technical articles and other documents to the extent it determines to be appropriate; and (ii) WRAIR may release such information where such release is required by law or court order.

XI. Liabilities

To the extent limited by law, each Party acknowledges that it will be responsible for the claims for damages arising from personal injury or damage to persons or property to the extent they result from negligence of its employees, agents, instructors or students.

XII. Force Majeure

Neither Party shall be liable for any unforeseeable event beyond its reasonable control not caused by the fault or negligence of such Party, which causes such Party to be unable to perform its obligations under this Agreement (and which it has been unable to overcome by the exercise of due diligence), including, but not limited to, flood, drought, earthquake, storm, fire, pestilence, lightening and other natural catastrophes, epidemic, war, riot, civic disturbance or disobedience, strikes, labor disputes, or failure, threat of failure, or sabotage, or any order or injunction made by a court or public agency. In the event of the occurrence of such a force majeure event, the Party unable to perform shall promptly notify the other Party. It shall further use its best efforts to resume performance as quickly as possible and shall suspend performance only for such period of time as is necessary as a result of the force majeure event.

XIII. Period of Agreement

The term of this Agreement is for a period of twenty-four (24) months, commencing on the date of the last signature affixed below. Any Party may terminate this Agreement earlier upon delivery of written notice at least thirty (30) days in advance. Termination of this Agreement by any Party for any reason shall not affect the rights and obligation of the Parties accrued prior to the effective date of termination of this Agreement. If any Party requests modification of this Agreement, including extension of this Agreement, the Parties shall, upon reasonable notice of the proposed modification by the Party desiring the change, confer in good faith to determine the feasibility of such modification. Modifications shall not be effective until a written amendment is signed by duly authorized representatives of the Parties. If WRAIR terminates this Agreement, it shall not be liable for any costs resulting from or related to the termination, including participating school, or their students.


XIV. Signatures

WITNESS WHEREOF, the Parties have caused this Agreement to be executed in duplicate.

TEXAS WOMEN'S UNIVERSITY

WALTER REED ARMY INSTITUTE OF
RESEARCH

By: 
Lillian Chenoweth
Professor of Family Studies

By: 
Kent E. Kester
COL, MC
Commander

Date: 11/02/09

Date: 18 NOV 2009

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APPENDIX B

IRB Approval Letter



Institutional Review Board
Office of Research and Sponsored Programs
P.O. Box 425619, Denton, TX 76204-5619
940-898-3378 Fax 940-898-3416
e-mail: IRB@twu.edu

August 14, 2009

Mr. Robert H. Williams
42 Noanett Rd.
Needham, MA 02494

Dear Mr. Williams:

Re: Individual Differences in Adult Attachment as Predictors of Posttraumatic Stress in a Population sample of U.S. Army Soldiers

The above referenced study has been reviewed by the TWU Institutional Review Board (IRB) and was determined to be exempt from further review.

If applicable, agency approval letters must be submitted to the IRB upon receipt PRIOR to any data collection at that agency. Because a signed consent form is not required for exempt studies, the filing of signatures of participants with the TWU IRB is not necessary.

Another review by the IRB is required if your project changes in any way, and the IRB must be notified immediately regarding any adverse events. If you have any questions, feel free to call the TWU Institutional Review Board.

Sincerely,

Dr. David Nichols, Chair
Institutional Review Board - Denton

cc. Dr. Larry LeFlore, Department of Family Sciences
Dr. Lillian Chenoweth, Department of Family Sciences
Graduate School

APPENDIX C

Relationship Questionnaire

5. The following are four general relationship styles that people often report. Mark the style that best describes you or is closest to the way you are.

- ☐ It is easy for me to become emotionally close to others. I am comfortable depending on them and having them depend on me. I don't worry about being alone or having others not accept me.
- ☐ I am uncomfortable getting close to others. I want emotionally close relationships, but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others.
- ☐ I want to be completely emotionally intimate (close) with others, but I often find that others are reluctant to get as close as I would like. I am uncomfortable being without close relationships, but I sometimes worry that others don't value me as much as I value them.
- ☐ I am comfortable without close emotional relationships. It is very important to me to feel independent and self-sufficient, and I prefer not to depend on others or have others depend on me.

APPENDIX D

EXPERIENCES IN CLOSE RELATIONSHIPS – SHORT FORM

4. Please read the following statements and respond to each by indicating how much you agree or disagree with it. The term "others" refers to family members, friends, or romantic partners who make up your network of close relationships. Mark your answer using the following rating scale.

	STRONGLY DISAGREE	DISAGREE	SLIGHTLY DISAGREE	NEUTRAL	SLIGHTLY AGREE	AGREE	STRONGLY AGREE
It helps to turn to others in times of need.	1	2	3	4	5	6	7
I need a lot of reassurance that others really care about me.	1	2	3	4	5	6	7
I want to get close to others, but I keep pulling back.	1	2	3	4	5	6	7
I find that others don't want to get as close as I would like.	1	2	3	4	5	6	7
I turn to others for many things, including comfort and reassurance.	1	2	3	4	5	6	7
My desire to be very close sometimes scares people away.	1	2	3	4	5	6	7
I try to avoid getting too close to others.	1	2	3	4	5	6	7
I do not often worry about being abandoned.	1	2	3	4	5	6	7
I usually discuss my problems and concerns with others.	1	2	3	4	5	6	7
I get frustrated if others are not available when I need them.	1	2	3	4	5	6	7
I am nervous when others get too close to me.	1	2	3	4	5	6	7
I worry that others won't care about me as much as I care about them.	1	2	3	4	5	6	7

APPENDIX E

Post Traumatic Stress Checklist

1. Below is a list of reactions that Soldiers sometimes experience following deployment or in response to other stressful life experiences. Please mark how much you have been bothered by each problem **IN THE PAST MONTH.**

	NOT AT ALL	A LITTLE BIT	MODER- ATELY	QUITE A BIT	EXTREMELY
Repeated, disturbing <i>memories, thoughts, or images</i> of a stressful experience	1	2	3	4	5
Repeated, disturbing <i>dreams</i> of a stressful experience	1	2	3	4	5
Suddenly <i>acting or feeling</i> as if a stressful experience were <i>happening again</i> (as if you were re-living it)	1	2	3	4	5
Feeling <i>very upset</i> when <i>something reminded you</i> of a stressful experience	1	2	3	4	5
Having <i>physical reactions</i> (like heart pounding, trouble breathing, sweating) when <i>something reminded you</i> of a stressful experience	1	2	3	4	5
Avoiding <i>thinking about or talking about</i> a stressful experience or avoiding <i>having feelings</i> related to it	1	2	3	4	5
Avoiding <i>activities or situations</i> because <i>they reminded you</i> of a stressful experience	1	2	3	4	5
Trouble <i>remembering important parts</i> of a stressful experience	1	2	3	4	5
<i>Loss of interest</i> in activities that you used to enjoy	1	2	3	4	5
Feeling <i>distant or cut-off</i> from other people	1	2	3	4	5
Feeling <i>emotionally numb</i> or being unable to have loving feelings for those close to you	1	2	3	4	5
Feeling as if your <i>future</i> somehow will be <i>cut short</i>	1	2	3	4	5
Trouble <i>falling or staying asleep</i>	1	2	3	4	5
Feeling <i>irritable</i> or having <i>angry outbursts</i>	1	2	3	4	5
Having <i>difficulty concentrating</i>	1	2	3	4	5
Being " <i>super alert</i> " or watchful or on-guard	1	2	3	4	5
Feeling <i>jumpy</i> or easily startled	1	2	3	4	5

APPENDIX F

Demographics

1. AGE

- ① 18 - 19
- ② 20 - 24
- ③ 25 - 29
- ④ 30 - 39
- ⑤ 40 or older

2. GENDER

- ① Male
- ② Female

3. Highest Level of **Civilian Education**?

- ① Some High School
- ② High School Diploma /GED
- ③ Some College/Associate's Degree
- ④ Bachelor's Degree
- ⑤ Graduate Degree

APPENDIX G

PERCEIVED DANGER OF INJURY OR DEATH

11. How many times during your
MOST RECENT DEPLOYMENT did
you believe you were in serious
danger of being injured or killed?

0	0	0
1	1	1
2	2	2
3	3	3
	4	4
	5	5
	6	6
	7	7
	8	8
	9	9

APPENDIX H

Combat Exposure and Experiences

14. How often did you experience the following during the MOST RECENT DEPLOYMENT?

	Never	One Time	Two to Four Times	Five or More Times
Being attacked or ambushed	1	2	3	4
Receiving small arms fire	1	2	3	4
Seeing dead bodies or human remains	1	2	3	4
Handling or uncovering human remains	1	2	3	4
Witnessing an accident which resulted in serious injury or death	1	2	3	4
Seeing dead or seriously injured Americans	1	2	3	4
Knowing someone seriously injured or killed	1	2	3	4
Improvised explosive device (IED)/booby trap exploded near you	1	2	3	4
Working in areas that were mined or had IED's	1	2	3	4
Being physically moved or knocked over from an explosion	1	2	3	4
Being in threatening situations where you were unable to respond because of rules of engagement	1	2	3	4
Shooting or directing fire at the enemy	1	2	3	4
Calling in fire on the enemy	1	2	3	4
Engaging in hand-to-hand combat	1	2	3	4
Clearing/searching homes or buildings	1	2	3	4
Clearing/searching caves or bunkers	1	2	3	4
Witnessing brutality/mistreatment toward non-combatants	1	2	3	4
Being wounded/injured	1	2	3	4
Seeing ill/injured women or children who you were unable to help	1	2	3	4
Receiving incoming artillery, rocket, or mortar fire	1	2	3	4
Being directly responsible for the death of an enemy combatant	1	2	3	4
Feeling directly responsible for the death of a non-combatant	1	2	3	4
Witnessing a friendly fire incident	1	2	3	4
Feeling responsible for the death of US or ally personnel	1	2	3	4
Having a member of your own unit become a casualty	1	2	3	4
Had a close call, was shot or hit but protective gear saved you	1	2	3	4
Had a buddy shot or hit who was near you	1	2	3	4
Participating in IED/mine clearing operations	1	2	3	4
Saved the life of a Soldier or civilian	1	2	3	4
Observing abuse of Laws of War/Geneva Convention (e.g., weapons cached in Mosques, schools, or hospitals)	1	2	3	4
Encountering sniper fire	1	2	3	4
Seeing Unit member blown up or burned alive	1	2	3	4
Witnessing harassment of non-combatants	1	2	3	4
Witnessing unnecessary destruction of property	1	2	3	4

APPENDIX I

Index Trauma

2. Was the stressful experience or experiences that you were thinking of in Item 1 on the previous page, related to:

- ☐ The most recent deployment
- ☐ A previous deployment
- ☐ The military (but not part of a deployment)
- ☐ Other life experience
- ☐ NA (did not have any stressful experience) - **Skip to question 5 on this page.**