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Julia Merlin 03/28/2013

The prevalence and genesis of proximal and distal resilience in an urban trauma population

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Abstract

The prevalence and genesis of proximal and distal resilience in an urban trauma population
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Exposure to childhood abuse is associated with increased risk for psychopathology as an adult. Victims of childhood abuse, however, may also present as resilient. Resilience is defined as competent social functioning following a traumatic event, as well as the absence of psychopathology. Research is vague as to why victims develop resilient or psychopathological patterns of behavior following traumatic events, and what lifestyle or neurological correlates contribute to either. Adult participants were recruited as part of a larger NIMH-funded study of trauma-related risk and resilience in a highly traumatized sample arriving for care in an urban public hospital. Childhood abuse history was assessed from the Childhood Trauma Questionnaire. Inner-emotional components of resilience (proximal resilience) were determined from the Emotional Dysregulation Scale, a subscale of the Social Cognition and Object Relations Scale and the positive component of the Positive and Negative Adjective Scale. Social/environmental (distal resilience) components were assessed from the Life-Base Interview and from the Clinical Data Form. A modified dot-probe task examined differences between proximal and distal resilience as predictor of attention bias for happy and threatening human facial stimuli. Results show participants who self-report the most severe childhood abuse history are more likely to develop proximal resilience than distal resilience. Attention biases for threatening or happy stimuli were not significant predictors for proximal or distal resilience components in the dot-probe task. These findings suggest that disparities within resilience development directly relate to traumatic history. Future research should focus on fostering specific components of resilience to lessen psychopathological development.

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The prevalence and genesis of proximal and distal resilience in an urban trauma population

The pervasiveness of interpersonal trauma in society is an unfortunate and undisputed fact. Populations have been plagued by combat and civilian traumas for centuries. Victims are impacted by their traumas both during and after the events. Since the Vietnam War, researchers have studied the effects of wartime trauma on combat veterans. The inclusion of posttraumatic stress disorder (PTSD) as a Diagnostic and Statistical Manual of Mental Disorders (DSM)-recognized medical disorder arose from this research, although ancient historians postulated its existence as early as 2000 BCE. More recently, researchers have begun to study the influences of urban civilian trauma on the affected populations, most commonly inner-city dwellers of a lower socioeconomic standing. Urban civilian traumas may include childhood maltreatment or abuse, rape, motor vehicle accidents, robberies, and/or domestic violence (Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993). Urban civilians are at a higher risk of interpersonal and other trauma exposure. Although there are many differences between wartime and urban environments, research has shown that combat victims and civilian victims are at a similar risk for developing PTSD following their respective traumas (Bremner, 2001). PTSD is diagnostically defined as 1) re-experiencing of the traumatic event, 2) avoidance/numbing behavior, and 3) hyper-arousal, each having persisted for longer than one month (American Psychiatric Association, 2000). PTSD can be self-treated with drugs or alcohol, which may result in substance abuse (Brown & Wolf, 1994). It was suggested by Brown and Wolf (1994) that one-third to one-half of substance abusers can be diagnosed with PTSD. People with PTSD also suffer from insomnia, social withdrawal and mistrust, hyper-vigilance, and loss of emotion (Schumm, Hobfoll, & Keogh, 2004).

Due to this prior research, a wave of modern studies is now focusing on investigating the consequences of civilian trauma. Kilpatrick, Saunders, Veronen, Best, and Von (1987) sampled a community of women and reported a 75% lifetime rate of exposure to urban civilian trauma, including a wide variety of crimes. Of these same women, 27.8% of those whom had witnessed any crime were diagnosed with lifetime PTSD according to DSM-III diagnostic criteria.

Child abuse

Although there are a variety of nuanced delineations, child abuse can be defined as sexual, emotional, and/or physical abuse against a minor by an adult or an older teenager. Systemic child abuse is one of the most destructive and widely prevalent urban civilian traumas (Meyerson, Long, Miranda, & Marx, 2002; U.S. Department of Health and Human Services, 2007). In 2005, 3.3 million children were allegedly neglected or abused, and their cases investigated by child protective services in their respective states (U.S. Department of Health and Human Services, 2007). These statistics do not account for unreported cases of abuse. Researchers are continuously delving into the effects of childhood maltreatment on both children and adults. Studies involving children with a recent child abuse history have found an increase in the development of substance abuse, risky or inappropriate sexual behavior, poor self-esteem, active defiance, bad school performance, early incarceration, depression, sleep disturbances, PTSD, mood disorders, and eating disorders (Afifi, & MacMillan, 2011; Browne & Finkelhor, 1986; Cutajar, Mullen, Ogloff, Thomas, Wells, & Spataro, 2010; McClure, Chavez, Agars, Peacock, & Matosian, 2008; Meyerson et al., 2002). Children with a history of sexual abuse also have stunted physical growth and atypical stress responses, which has been associated with an atrophied hypothalamic-pituitary-adrenal (HPA) axis (Carpenter, Carvalho, Tyrka, Wier, Mello, Mello, &…Price, 2007). Research suggests that intelligence is not diminished by childhood

abuse or correlated psychopathology, as measured by a general IQ test, but that specific aspects of intelligence (such as better performance on verbal or non-verbal tasks) vary in victims of childhood abuse due to neurological differences in connectivity and function (Wingo, Fani, Bradley, & Ressler, 2010).

Adults with a history of childhood abuse are similarly affected, demonstrating that the impact of childhood abuse persists throughout a lifetime. Child abuse victims may develop PTSDduring their childhood, adolescence, or adulthood depending on several personality and trauma characteristics. A child abuse history also makes adults more prone to risky sexual behavior, obesity, poor social-functioning skills, maladaptive sexual functioning, depression, anxiety disorders, late-life cognitive deficits, mood disorders, and revictimization (Afifi & MacMillan, 2011; Bentley, & Widom, 2009; Bogar & Hulse-Killacky, 2006; Browne & Finkelhor, 1986; Cutajar et al., 2010; Lamoureux, Palmieri, Jackson, & Hobfoll, 2012; McClure et al., 2008; Polusny & Follette, 1995; Ritchie, Stewart, Dupuy, Courtet, Malafosse, & Ancelin, 2011; Rodriguez, Ryan, Vande Kemp, & Foy, 1997; Schumm & Keogh, 2004; Schumm, Stines, Hobfall, & Jackson, 2005). Revictimization refers to the formation of a detrimental pattern of traumas in which a victim is more likely to be victimized again following a previous attack (Browne & Finkelhor, 1986; Bremner, 2001; Schumm et al., 2004; Schumm et al., 2005). Childhood abuse predisposes women for future abuse, ranging from domestic violence to forcible rape (Browne & Finkelhor, 1986; Bremner, 2001; Schumm et al., 2004; Schumm et al., 2005). While childhood abuse victims are more susceptive to developing PTSD, revictimization is specifically correlated with more acute PTSD (Shumm et al., 2004). The maladaptive social correlates indicative of PTSD make this vicious circle all the more detrimental for abuse victims. Neurocognitive effects are also evident in adult survivors of child abuse.

It is important to note while studying PTSD and the negative outcomes that may arise following childhood abuse or other civilian traumas, that these are each a possibility and not a certainty. While child abuse increases risks for psychopathology, every victim does not develop PTSD or any of the previously mentioned disorders. Many do not develop any psychopathology. Trauma victims are actually less likely to have psychological disorders following traumatic events than previously believed (Bonanno, 2004; Masten, 2001; Williams & Nelson-Gardell, 2012). Trauma psychology defines this state of psychopathological resistance as "resilience," or "bouncing back." Current research findings are unclear as to the origination or reasoning behind resilience. The consensus, however, is that resilience is the understated norm while PTSD and other psychopathologies are the more noticeable anomalies, receiving more direct attention due to their adverse effects.

While a general definition of resilience is established, there are several gradations and nuances, as indicated by the divisive literature regarding its existence and creation (Agaibi & Wilson, 2005). Resilience can be operationally defined as the absence of psychological disorders (Williams, & Nelson-Gardell, 2012; Wingo et al., 2010; Yehuda, Flory, Southwick, & Charney, 2006). Other researchers, however, quarrel on specifics. Bonanno (2004) states that the presence of diagnosable psychological disorders is inconsequential providing adaptive social and emotional functioning, and that resilience is defined as the ability to smoothly integrate into society. For example, an individual with major depressive disorder (MDD) or PTSD, but stable social relationships, could be considered resilient. This discrepancy is reflective of a key difference in resilience literature: namely, whether individual characteristics or social environmental factors are the main contributors to resilience development. Social standards vary as well within cultures and economic contexts, with differing opinions as to what is reasonably

healthy, what is necessary, and what is variable. Other researchers have combined these two definitions of resilience into one, delineating resilience as both social stability and the absence of psychological disorders (Dubow, Edwards, & Ippolito, 1997; Felner, Brand, DuBois, Adan, Mulhall, & Evans, 1995) while others still incorporate additional criteria, including an absence of suicidal ideation, no drug or alcohol use, and good school performance (Chandy, Blum, & Resnick, 1996) and good quality of sleep (Chambers & Belicki, 1998).

One of the principle intricacies of resilience research is whether to define resilience both by external adaptive factors (academic success, stable social relationships) or internal adaptive factors (self-esteem, low/absence of anxiety or depression), or a combination thereof (Luthar, Cicchetti, & Becker, 2000). Previous research has defined resilience as the presence of adaptive individual factors, while other research has stated that resilience is fostered by supportive external factors. Emphasis on specific preventative measures or protective factors may affect adaptation criteria. For the purpose of this study, we define resilience as both the absence of current diagnosable psychological disorders as well as integrated social stability and functioning. We believe a whole person approach is necessary when examining resilience, since various factors contribute to a person's development. Diagnostic disorders can reflect inner/individual aspects while adaptive or maladaptive social functioning exposes environmental coping patterns; both contribute to resilience in a whole person approach. It is difficult to parse what or who is responsible for each aspect of personhood, and harder still to know how each contributes to resilience or psychopathology without considering the whole person.

Biological contributions to resilience

Numerous biological studies have investigated how the human brain contributes to the development of resilience. Resilience, at its core, can be considered the body's attempts at allostasis: following any acute stress, whether psychological or physical, human nature is to

temper back to a normative state through physiological or behavioral changes (Charney, 2004; Feder, Nestler, & Charney, 2009). The hypothalamus-pituitary-adrenal (HPA) axis is important for maintaining internal hormonal regulations in the face of stress. The HPA axis, through the release of corticotropin releasing factor (CRF) from the hypothalamus and adrenocorticotropic hormone (ACTH) from the pituitary, stimulates the release of glucocorticoids from the adrenal cortex. Glucocorticoids, most often cortisol, respond to counter the effects of stress on the body. CRF also mediates the adrenal release of catecholamines, hormones such as dopamine, epinephrine, and norepinephrine released during times of stress (Charney, 2004; Pace & Heim, 2011; Yehuda, 2001). Negative feedback in the HPA axis, due to production of CRF and ACTH, allows glucocorticoid production to inhibit both primary CRF and ACTH production.

In a healthy person, glucocorticoids are released following a stressor, and hormone levels soon regulate to normal when stress hormones are no longer required. The process is similar, if not identical, in a resilient person. A person with PTSD, however, suffers from increased fear response and sensitivity to anxiety producing stimuli, which can be correlated with a hyper-active HPA axis. More glucocorticoids are produced in an effort to temper the stress. When fear and stress are chronic, as in PTSD, glucocorticoid levels remain high. Sustained glucocorticoid exposure can have a detrimental influence on brain structure and function, including persistent abnormal HPA axis activity and hippocampal atrophy (Bremner, 2001; Charney, 2004; Yehuda, 2001). Prolonged stress has been found to negatively affect the HPA axis in patients with anxiety disorders, MDD, alcoholism, and PTSD (Carpenter, Tyrka, Ross, Khoury, Anderson, & Price, 2009; Carpenter et al., 2007; Diamond, & Ingersoll, 1996). Glucocorticoids can enhance amygdala activity, as well as expedite the encoding of emotionally valenced memories (Charney, 2004). PTSD is associated with increased emotion surrounding

memories, often linked to the encoding of fear-related memories. Increased levels of catecholamines, present during PTSD as well as after childhood abuse, have been similarly linked to hippocampal damage and atrophy in other brain areas (DeBellis, Spratt, & Hooper, 2011).

The brain, however, does not sustain this level of activity. Negative feedback in the HPA axis causes the influx of glucocorticoids to inhibit the crucial release of CRF and ACTH. Glucocorticoid production, including production of cortisol, then drops dramatically. Initially, PTSD may be related to acute high cortisol which, with the inclusion of consequential effects, leads to chronic lowered cortisol and long-term dysregulation in the following years after the initial trauma (Bremner, 2001). Victims with PTSD exhibit lower levels of basal cortisol than controls (Carpenter et al., 2009; Yehuda, Yang, Buchsbaum, & Golier, 2006). Adults with a history of childhood sexual abuse also have lower levels of cortisol than control adults with no history of abuse when studied independently of psychopathology (Carpenter et al., 2007). It has been suggested that chronic stress creates a predisposition for HPA axis deterioration, and while the HPA axis makes an attempt to regulate, too much damage has already been done. Low cortisol levels are associated with an increased susceptibility to trauma or stress. Some researchers consider low cortisol levels to be a risk factor for psychopathology, a biological factor that precedes PTSD.

Another neurological method of explaining allostasis involves fear conditioning. In psychological history, fear conditioning is most directly associated with Pavlovian classical conditioning and is, most simply put, the study of predictive fear as caused by environmental stimuli (Maren, 2001). Joseph LeDoux and other neuroscientists known for research in fear conditioning have aided the understanding of fear and anxiety pathways in animals and humans

(Davis, Falls, Campeau, & Kim, 1993; Ledoux, 2000). Typically, fear conditioning involves pairing a foot shock with a light or a tone. Fear-potentiated startle is a frequently used paradigm for studying fear conditioning; in such a model, a rodent becomes conditioned to predict the delivery of an electrical shock, therefore associating a neutral context with a specific fearful, painful stimulus when fear is measured as an increase in a simple startle reflex (Davis et al., 1993). In an example of auditory fear conditioning, a rat is placed inside of a conditioning chamber during a primary trial in order to habituate to the empty room. The rat is given no auditory stimulus, and no shock. Later, during a conditioning session, the rat is given both an auditory stimulus and an electric shock. Using Pavlovian classical conditioning terms, the auditory stimulus is considered a conditioned stimulus (CS) and the electric shock an unconditioned stimulus (US). Researchers then measure the rat's behavioral reaction to the electric shock, most commonly by recording "acoustic startle," an innate fear response. After several conditioning trails, researchers present the CS independently and measure for acoustic startle. Given that there was little to no acoustic startle when only the CS was presented originally, freezing to the CS indicates new learned behavior (Davis et al., 1993, Shi & Davis, 1999). A similar study conducted with the same fear-potentiated startle paradigm found similar results when examining another traditional measure of fear in rats: freezing. Fanselow (1982) showed that rodents froze more following a shock and after presentation of the CS. Startling, or freezing, to the CS only is an example of fear conditioning because the rat learns to associate a neutral stimulus with a previously threatening stimulus, and react fearfully to a perceived threat.

People with PTSD and other anxiety disorders instinctively react to threatening or stressful events in a similar manner. In PTSD, fear conditioning is related to associating neutral stimuli with memories from previous traumas, unconsciously acquiring and reconsolidating

fearful memories (Elsesser, Sartory, & Tackenberg, 2004; Shin, Whalen, Pitman, Bush, Macklin, Lasko, & Rauch, 2001). Traumatic memories are an expression of emotional conditioning. As an example, a person with PTSD may have associated certain sounds, smells, or sights with their trauma during an initial acquisition phase. A PTSD patient who smelled bleach (CS) during his /her trauma may, when presented with the smell (CS) later in life, experience an incursion of autonomic arousal and fearful behavioral responses. The US/CS acquisition pairing formed during the trauma can trigger emotional responses that contribute to PTSD's chronic anxiety. Stimulus generalization, or the likelihood for pairings to be formed between stimuli similar to the CS, also plays a detrimental role in PTSD fear conditioning. Using the previous example, the PTSD patient could also be afraid of vinegar, ammonia, chlorine, and other strong smelling chemicals because he/she formed similar fearful associations.

Fear conditioning involves communication between several structures in the brain including the amygdala and its projections to other brain areas. During the enactment of fearful behavior, the lateral amygdala feeds to the main output nucleus, the central nucleus of the amygdala, which then projects to several areas of the hypothalamus and the brainstem. The hypothalamus and brainstem serve to facilitate an increase in heart rate, an increase in breathing, and muscle contraction, each associated with fear (Charney, 2004; Elsesser et al., 2004). The amygdalae-hippocampal connection is also important for the acquisition, retrieval, and reconsolidation of fearful memories (Charney, 2004; Degan & Fox, 2007; Maren, 2001). The amygdala modulates the strength of emotionally valenced memories while the hippocampus is commonly considered a relay station for memories as they transition from short-term to long term status. Since the neutral CS becomes associated with the presented fearful stimuli, the consolidated memory similarly links them. During fear conditioning, the neutral context may be

presented independently, but the association persists. Fearful responses endure, as do an increased heart rate, muscle contractions, recollection of previous threatening or frightening events, and feelings of panic (Charney, 2004; Elsesser et al., 2004; Maren, 2001). When the memory is reconsolidated, the connection is only strengthened. Pitman (1989) deduced that an elevation in catecholamines, as produced under a highly stressful traumatic event, contributes to memory "over-consolidation." "Over-consolidated" memories can be fragmented, either ill-formed or incomplete, or weighted too significantly, since overexposure to catecholamines biases emotionality with hyperreactive and overemotional tendencies; they are defined as abnormal, emotionally saturated memories. These inappropriately formed memories contribute to re-experiencing and flashback symptoms indicative of a PTSD diagnosis (Pitman, 1989).

While the amygdalae-hippocampal connection is not regularly associated with the retrieval of long term memories, fear conditioning research has indicated that the medial prefrontal cortex (mPFC) plays a role in storing long-term extinction memory. After acquisition, a US/CS pairing is formed and consistently elicits behavioral responses. Extinction interrupts the reinforcement of the US/CS pairing, presenting the CS alone until it no longer accurately predicts the arrival of the CS, and conditioned responding is discontinued. Extinction plays an important role in PTSD since severing US/CS pairs in PTSD victims can help to reduce startle responses, anxiety, and generalized fear. Charney (2004) found that the destruction of the mPFC prevented the recollection of fear extinction. Without an active mPFC, US/CS pairings and conditions continued to elicit reactions as if extinction had never taken place. People with PTSD often take longer to extinguish in laboratory experiments, which could indicate delayed response in mPFC activity (Fani, Tone, Phifer, Norrholm, Bradley, Ressler, &…Jovanovic, 2012). A PTSD+ participant displays prolonged extinction as compared to trauma controls, which is

defined as the elongated amount of time in which it takes the state of extinction to occur from beginning to end following acquisition. Research by Fani, Tone, and colleagues (2012) sought to examine the processes integral to prolonged extinction by accounting for attention biases during fear learning. Results from a dot-probe task show that PTSD participants attend toward threat, meaning higher fear expression is displayed in PTSD participants than controls when threatening stimuli are present. In a dot-probe task, participants are presented with neutral, threatening, and happy photographs of human facial expressions for a specific period of time, and then asked to respond to an unconnected task. Response time measurements, namely the delay differences following the presentation of emotional and neutral faces, allows for determination of attention biases for threatening stimuli. Participants can be biases towards or away from both happy and threatening stimuli. Dot-probe findings were correlated with elongated extinction and exaggerated responses to fear-potentiated startle in the same PTSD participants. These findings suggest that attention bias towards threat is indicative of an inability to separate from threatening or stressful stimuli, perhaps due to dysfunctional coping or attention styles. Attention bias towards threat is representative of heightened fear conditioning, and indicated by delayed extinction.

Pitman's (1989) hypothesis of "over-consolidation" may also help explain persistent initial fear responses. DSM-IV diagnostic criteria for both depression and PTSD indicate periods of "rumination" and "re-experiencing," respectively. Both can involve dwelling on fearful or traumatic memories. A person with a hyper-active amygdala, or overactive amygdalae-hippocampal connection, would be more prone to consolidate emotionally valenced memories, leaving the individual more likely to develop PTSD. The mPFC, an area of the prefrontal cortex commonly associated with mediating executive functions such as behavioral control, has been

found to inhibit amygdala activation (Feder et al., 2009; Maier, Amat, Baratta, Paul, & Watkins, 2006; Sotres-Bayon, Bush, & LeDoux, 2004; Yehuda et al.,2006). Adults with a history of childhood sexual abuse (CSA) have reduced mPFC activation (Hart & Rubia, 2012) and PTSD may arise following a loss of this inhibition and the ensuing overactive amygdala activity (Charney, 2004; Bremner, 2007; Bremner, Narayan, Staib, Southwick, McGlasha, & Charney, 1999; Maier et al., 2006; Yehuda et al., 2006). Resilience thrives in the presence of an activemPFC and a weaker amygdala (Feder et al., 2009; Maier et al., 2006).

The neurobiology of resilience has indicated the importance of other brain areas besides the amygdala and the mPFC. Each can be perceived in the context of the common fearful conditioning scenario and has been researched as such throughout the field. There are several pervasive links, even among differing brain areas. The hippocampus is an important relay center for memories and is associated with an ability to accurately place memories in time and context. Damage to the hippocampus or its connections has been associated with memory loss and/or difficulty with consolidation, acquisition, and reconsolidation (Diamond & Ingersoll, 1996; Bremner, Randall, Vermetten, & Staib, 1997; Bremner, Vythilingam, Vermetten, Southwick, McGlashan, Nazeer, & …Charney, 2003). The diagnostic criteria for PTSD include the re-experiencing of traumatic memories, meaning that these traumatic memories may be consistently vivid and present. Other symptoms include difficulty recalling aspects of abuse flashbacks, or difficulty overcoming fear associations. The hippocampus may hold responsibility for some of these symptoms. When an individual with PTSD is exposed to threatening or fearful stimuli, similar to the stimuli present at the original traumatic event, he/she reacts with several re-experiencing symptoms. This has previously been referred to above as fear conditioning, or overgeneralization of fear. A dysfunctional hippocampus facilitates inefficient encoding and

consolidation of the original memory (Bremner et al., 1997; Bremner et al., 2003; Gilbertson, Shenton, Ciszewski, Kasai, Lasko, Orr, & Pitman, 2002; Haglund, Nestadt, Cooper, Southwick, & Charney, 2007). Since the hippocampus plays a key role in detecting match/mismatch of novel or familiar information, atrophy of the hippocampus subverts habituation and increases mismatch between new information and previous traumatic memories (Gray, 1988; Strange, Fletcher, Henson, Friston, & Dolan, 1999). A smaller hippocampus facilitates fear conditioning, because new stimuli are more commonly mismatched with fear inducing stimuli from a previous traumatic incident. It is commonly presumed that hippocampal atrophy can be a result of stress exposure, particularly chronic exposure to glucocorticoids. Neurobiological contributors to PTSD, namely a hyper-active HPA axis and resulting drop in cortisol, are correlated with smaller hippocampal volume (Antelman & Brown, 1972; Bremner, 2001; Gray, 1988; Strange, Fletcher, Henson, Friston, & Dolan, 1999; Yehuda, 2001).

Both the mPFC and the hippocampus have been found to affect PTSD as associated with memory, and disturbances to these brain areas can be indicative of PTSD (Charney, 2004; Bremner et al., 1997; Bremner et al., 2003; Bremner, 2007; Bremner et al., 1999; Gilbertson et al., 2002; Haglund et al., 2007; Maier et al., 2006; Yehuda et al., 2006). The mPFC and the hippocampus are also both involved in extinction. As previously discussed, people with PTSD present with prolonged extinction. This has been observed in the aforementioned laboratory scenario, and may also be explanatory for the overgeneralization of fear. A disrupted mPFC is not the only neurological explanation for this reaction. Antelman and Brown (1972) conducted a lesion study with rodents and discovered it was harder to extinguish fear-related memories in rodents with hippocampal lesions. The rodents with hippocampal lesions continued to freeze to the CS alone for a longer period of time than did the control rodents. These findings can be

generalized to humans. PTSD is associated with prolonged extinction, and researchers have also found a relationship between smaller hippocampal volume in people with a childhood abuse history and/or PTSD (Bonne, Brandes, Gilboa, Gomori, Shenton, Pitman, & Shaley, 2001; Haglund et al., 2007; Porter, Lawson, & Bigler, 2005; Stein, Koverola, Hanna, & Torchia, 1997). In particular, a decrease in left hippocampal volume has been found following childhood abuse, while a right hippocampal decrease is more commonly associated with combat trauma (Bremner et al., 1997; Bremner 2001; Stein et al., 1997). Both people with childhood abuse and PTSD have a smaller hippocampus than non-trauma controls, leading to delayed fear extinction and increased fear conditioning.

Smaller hippocampal volume may also contribute to fear conditioning susceptibility in individuals with PTSD and maladaptive emotion regulation. Hart and Rubia (2012) found that children with a history of childhood abuse have difficulty accurately identifying various emotionally valenced faces and differentiating between anger, sadness, and happiness. These same children had decreased connectivity between the ventromedial prefrontal cortex (vmPFC), amygdala, and hippocampus (Hart & Rubia, 2012). A decline of connectivity in these emotion- and memory-based brain structures would directly contribute to the behavioral findings. This suggests that the observed decreased neurological connectivity results in inhibited emotional discrimination (Hart & Rubia, 2012; MacLeod, Rutherford, Campbell, Ebsworthy, & Holker, 2002). It is important to note that, while both child abuse and PTSD may be independently linked to a smaller hippocampus, both are often present together. Bremner and colleagues (2003) found that the mean hippocampal volume of a woman with comorbid childhood abuse and PTSD is 16% smaller than the hippocampal volume of an abused woman without PTSD, and 19% smaller than that of control women.

Another brain area has been indicated as a crucial element for fear conditioning and emotion regulation: the anterior cingulate cortex (ACC). The ACC modulates a variety of autonomic and cognitive functions, including the regulation of heart rate, decision-making, and emotional control (Banich, Mackiewicz, Depue, Whitmer, Miller, & Heller, 2009; Egner, Etkin, Gale, & Hirsch, 2008; Shin et al., 2001). The dorsal ACC, or the attention component, is connected to the prefrontal cortex, parietal cortex, and premotor areas (Banich et al., 2009; Egner et al., 2008). It is essential in designating control to other brain areas. The ventral ACC, or emotional component, is connected to the amygdala, nucleus accumbens, and hypothalamus. The ventral ACC helps to determine the appropriate emotional valence and strength of emotionality per memory (Banich et al., 2009; Egner et al., 2008). Both components of the ACC play a critical role in emotion regulation and emotion-based decisions. A neuroimaging meta-analysis indicated that people with PTSD have decreased ACC activation (Banich et al., 2009; Charney, 2004; Shin et al., 2001). The rostral ACC, normally activated during the processing of emotional stimuli, shows decreased activation in a PTSD-group as compared to a control, non-PTSD group (Shin et al., 2001). The ACC of women with both PTSD and a childhood abuse history had a lower blood flow response than the ACC of non-PTSD women with a childhood abuse history although controls had more ACC blood flow activation than both groups (Hart & Rubia, 2012). People with PTSD may be incapable of appropriately recruiting the ACC during a confrontation with threatening information, and therefore struggle when directing emotion-based attention (Banich et al., 2009). A decrease in ACC activation and subsequent regulation of the amygdala propels the development of fear overgeneralization (Egner et al., 2008; Shin et al., 2001). The ventral ACC may be unable to accurately determine the appropriate emotional valence of new

memories and/or the dorsal ACC may be deficient in controlling a fitting autonomic and behavioral response, resulting in the hyper-reactivity to threat associated with PTSD.

The ventromedial prefrontal cortex (vmPFC) is an additional brain area known for significant contributions to successful decision making. Similarly to the ACC, the vmPFC is associated with emotion regulation and decision making (Clark, Bechura, Damasio, Aitken, Sahakian, & Robbins, 2008). Damage to the vmPFC is correlated with impulsivity, socially inappropriate behavior, and a difficulty inhibiting behavioral responses (Banich et al., 2009; Clark et al., 2008). Posttraumatic stress disorder is associated with decreased activity in the vmPFC as compared to non-PTSD controls (Banich et al., 2009; Wingo et al., 2010). The decreased inhibition related to vmPFC damage can be correlated to symptoms of PTSD, specifically the prevalence of overgeneralizing fear. The decreased ability to appropriately inhibit emotional responses to previous information, thereby reacting on instinct, appears correlated to the hyper-reactivity to threat observed in PTSD patients.

There is currently no one brain region or set of regions considered the neurological catalyst of PTSD. Most likely, as research has shown, the interconnectedness of associated brain areas plays a critical role in PTSD's development and the demonstration of its vivid and diverse symptoms. Disrupted activity in the hypothalamic-pituitary-adrenal (HPA) axis has been shown to result in a hyper-reactivity to stress, releasing an overabundance of structurally damaging glucocorticoids. Cortisol release, however, is reduced, leading to greater stress sensitization. Hyper-reactivity to stress can lead to an overgeneralization of fear, or fear conditioning. Everyday neutral contexts become associated with threatening, fearful memories and stimuli from traumatic incidences. This tendency for overgeneralization can contribute to panic disorders, phobias, anxiety disorders, and PTSD. The natural neurological mechanisms in effect

to counteract this sensitization are variable in a person with PTSD; a less active medial prefrontal cortex (mPFC) does not sufficiently inhibit the amygdala, contributing to a hyper-reactive amygdalae-hippocampal connection with highly emotionally valenced memory consolidation; diminished left hippocampal volume impairs emotion regulation and access to or persistence of trauma memories; a less active anterior cingulate cortex (ACC) is incapable of properly regulating the amygdala, diminishing emotional regulation, and also fails to direct an appropriate response; a disrupted ventromedial prefrontal cortex (vmPFC) contributes to impulsivity and increases difficulty inhibiting responses to emotional stimuli, leading to hyper-reactivity to threat and stress sensitization. Research has not yet concluded there is damage to all of these presented brain areas in a PTSD patient at a given point in time, as no known study has examined the present inhibitions and connections between them all. Each, however, have been indicated as diminished either in activation or volume in PTSD patients, and respective contributions of this damage discussed. The tendency of PTSD patients to be excessively vigilant to threatening stimuli may be associated with increased demands placed on brain areas involved in memory function, planned responses, and emotional regulation after confrontation with plausibly threatening stimuli.

Methods of Study

There are several methodologies for studying neurological differences amongst people with a trauma history. A staple of neurological research is functional magnetic resonance (fMRI). This procedure is used for brain mapping and imaging by detecting changes in blood flow. Studies typically involve asking a participant to complete a designated task while inside an fMRI scanner. Oxygenated blood circulates most heavily in areas of activity, and fMRI images reflect enhanced activation via blood-oxygen-level-dependent (BOLD) contrast due to magnetic differences in oxygen enriched and oxygen poor blood. Differences in brain region activation

can be compared across sample groups due to different patterns of brain activity while task completion. Comparisons are made across three scans: resting state images, control group, and experimental group. Resting state fMRI images are taken of all participants brains for points of comparison between brain regions in active, or during task completion, and inactive, or inactive, situations. Brain region activation differences between the control and experimental group are compared in order to investigate how factors of interest affect brain areas. Researchers can compare similarities and differences in brain function between controls and participants with a trauma history.

Psychopathological neurobiology indicates several key areas of discrepancy: emotional regulation, impulsivity, and memory processing. Cognitive procedures that investigate interactions between these paradigms, both in psychopathological and resilient participants, are staples in trauma research. Two such tasks are the emotional Stroop and the dot-probe. Both can be, but are not necessarily, coupled with fMRI brain imaging. The emotional Stroop task assesses emotional regulation in the presence of fearful or threatening stimuli. The emotional Stroop task presents both a color and a word simultaneously, either paired with a solid color background or with colored text, and a participant then reports the color on the screen. The task measures a participant's response time between color matches and mis-matches with emotionally valenced words, such as "gun" or "rape" as compared to neutral words, like "chair" or "pillow." Participants with anxiety disorders show slower response times when trying to repeat the color of an emotionally valenced word (MacLeod & Macdonald, 2000). During an emotional Stroop task, participants with diagnosed anxiety disorders show decreased anterior cingulate (ACC) activation when presented with words relevant to their disorder (Charney 2004; Shin et al., 2001). This finding is consistent with prior neurobiological findings in PTSD, in which a

decrease in ACC activation correlates with diminished emotion regulation due to a less regulated amygdala. Women with PTSD also present with less medial prefrontal cortex (mPFC) activation in an emotional Stroop task than non-PTSD women (Bremner, 2007). These results are also consistent with previous reports of PTSD neurobiological findings, as a diminished mPFC does not sufficiently suppress the amygdala, which can result in an increased amygdalae-hippocampal pathway and highly emotional memories.

The dot-probe assesses selective attention, particularly to emotionally valenced stimuli that are either threatening or happy (Mogg & Bradley, 1999). Like the emotional Stroop, the dot-probe presents a participant with emotional stimuli and requires him/her to focus on a non-emotional task, where performance is measured by the ability to dispel emotionality as needed to complete the task at hand. The dot-probe task, however, is used to assess attention biases. Participants are presented with paired pictures of a variation of emotional valences, including happy, threatening, and neutral, for several hundred milliseconds. A fixation cross appears following the images and the participant indicates its location (left or right) on a button box. Response time disparities between when a fixation cross replaces a neutral image vs. an emotional image indicates attention bias towards or away from that emotion. Results are mixed, although many studies have found that participants with PTSD, depression, and anxiety disorders selectively attend towards (respond faster to) threatening images (Fani et al., 2012; Gibb, Schofield, & Coles, 2009) while others demonstrate attention bias away from threat (Pine, Mogg, Bradley, Montgomery, Monk, McClure et al., 2005; Wald, Shechner, Bitton, Holoshitz, Charney, Muller, Fox, Pine, & Bar-Haim, 2011). Several dot-probe task studies modified for the inclusion of emotionally valenced human faces have previously examined neural emotion-attention interaction. During a dot-probe task, PTSD participants demonstrate higher amygdala activity as

compared to trauma controls when the task was modified to include human fearful faces (Rauch et al., 2000). The amygdala is more highly activated when presented with threatening stimuli, as compared to neutral stimuli (Armony & Dolan, 2002; Frewen, Dozois, Joanisse, & Neufeld, 2007; Murphy,Nimmo-Smith, & Lawrence, 2003). It is also important to note that an increased fear stimuli sensitivity has also been measured in functional amygdala outputs. Several of these amygdala outputs include brain regions with distinct connections to visual attention, including the ACC, mPFC and lateral prefrontal cortex (lPFC), and occipital cortices (Vuilleumier & Pourtois, 2007; Zald, 2003). As discussed earlier, previous neurobiological results have suggested that the ACC and mPFC are important in psychopathology development due to an inability to inhibit amygdalae activity. Another dot-probe task also revised to include threatening human faces showed an increase in activation of the dorsal anterior cingulate cortex (dACC) and dorsolateral prefrontal cortex (dlPFC) of PTSD patients as compared to trauma controls, where threat bias was negatively correlated with dACC activation (Fani, Jovanovic, Ely, Bradley, Gutman, Tone, & Ressler, 2012). Fani and colleagues (2012) suggest that the unexpected correlation between increased dACC activation and avoidant threat bias is due to the region's role in interference management. Additional research has suggested that the dACC contributes to attention paradigms, regardless of emotion, and is relevant for managing interference as well as distributing control and attention (Egner et al., 2008). These results are copacetic with prior neurobiological findings, as the dACC was previously indicated as a control center or a management hub.

One of the advantages of the dot-probe is its unique ability to consider the direction of attention bias, either towards stimuli or away from stimuli. The emotional Stroop does not lend itself to such direct results. The dot-probe can also include several types of stimuli, including

various pictures, while the emotional Stroop is more limited. Pictorial stimuli are directly visually accountable, and do not require excessive effort on the part of the researcher to determine validity (Fani, 2011). The inclusion in the dot-probe of distinct images or human facial expressions could be especially relevant while studying interpersonal trauma and resilience, as these visual stimuli may enhance the applicability of the task. The chosen images aremore directly related to past trauma history than other stimuli, and possibly more valid measures of attention bias. (Egloff & Hock, 2003) conducted a study during which participants responded to both the emotional Stroop and the dot-probe, for the purpose of comparing the association between each measure. Egloff and Hock (2003) showed that both the emotional Stroop and the dot-probe significantly measure attention allocation toward or away from threatening stimili, but there are distinctive differences between the two measures regarding specificity and processing. The dot-probe task can be modified to include human facial expressions of fear, happiness, and neutrality within a chosen race and gender. It is then representative of a population, because it summons salient expressions and faces as would be encountered during an everyday experience. Similarly, the dot-probe can then measure attention biases towards or away from happy and threatening stimuli as would occur during normal life events. For the purpose of this study, we chose to use the dot-probe task, as it may provide a more precise and directly representative measure of attention bias than the emotional Stroop due to the several noted advantages.

Dot-probe and emotional Stroop tasks have often been coupled with fMRI scanning, measuring patterns of neural activation in each emotional paradigm. The fMRI scan results can lend credence to neurobiological arguments regarding brain discrepancies in PTSD. Other dot-probe and emotional Stroop research designs, however, have chosen not to include fMRI scans in order to focus attention on patterns of measured behavior (Fani et al., 2012; Egloff & Hock,

2003; Wald et al., 2011). The cost of fMRI imaging is also exponentially higher than behavioral measures alone, and inevitably includes administrative difficulties such as scheduling, additional exclusion criteria, and incentives. For the purpose of this study, we chose not to include fMRI scans in order to avoid costly and time consuming procedures that would be more effective for use in future research.

Resilience

Neurological understandings of resilience are mainly derived from research directly constructed to study inconsistencies present during psychopathology. Little research has been conducted to specifically investigate neurological and behavioral patterns indicative of resilience. Yehuda, Golier and colleagues (2007) studied hippocampal volume in combat veterans with and without PTSD, with the hypothesis that hippocampal volume would be decreased when PTSD was present. Participants with similar trauma histories and defined resilience had similar hippocampal volume to healthy controls. While these findings are disparate from Haglund et al.'s (2007) hypothesis regarding resilience neurobiology, this is one of few studies specifically examining resilience. It is widely assumed or presumed that the absence of known psychopathological patterns is indicative of resilience (Bremner et al., 2003; Wingo et al., 2010; Yehuda et al., 2006). Given the various definitions of resilience, however, this approach to neurobiology leaves much to be desired. Resilience research would benefit from whole brain analyses, both fMRI and diffusion tension imaging (DTI), of trauma victims for the purpose of identifying additional discrepancies in neural connections other than the previously acknowledged fear circuitry. Additional brain regions may be paramount to resilience development, outside of the traditional fear circuitry paradigm, that are relatively unaltered in focused psychopathological measures. Specifically concentrating on resilient participants would allow for exploration of resilient vs. recovered neurobiology in an effort to

identify divergences between psychopathological, resilient, and recovered victims. Also, identifying neurobiological components indicative of resilience could help to foster therapeutic practices designed to stave off or decrease psychopathology.

Considerations on affect

It is important to note that science is divided over the causal directionality of neurological differences and the development of PTSD or resilience. Some researchers believe that neurological changes predate PTSD, thereby putting an individual at risk for disease development due to an increased likelihood for ineffective emotion regulation or stress processing (Gilbertson et al., 2002; Stein et al., 1997). The results of a study conducted by Gilbertson et al. (2002) examining the hippocampus and PTSD suggest that decreased hippocampal volume may be indicative of a risk for PTSD rather than a reaction from the disease. Several studies arguing that altered behavior necessitates a compensating change in neurobiology were previously presented. Generally this debate is referred to as the *vulnerability vs. acquisition hypothesis*, with some researchers proposing that PTSD causes neurological changes and others claiming that neurological alterations predispose the disease's development. Agaibi and Wilson (2005) state that resilience is predetermined whether or not a traumatic incident presents itself and is mustered by circumstance. Another theory considers resilience the product of the trauma, and a forced adaptive coping response (Bonanno, 2004; Feder et al., 2009). Without a true, ethical means of corroborating either side, researchers will most likely debate the topic throughout studies to come.

While the *vulnerability vs. acquisition hypothesis* is beyond the scope of the present study, it is important to note that the presence of behavior and/or neurological incongruities is not indicative of a succinct causative effect. Numerous behavioral and neurobiological differences are discussed while examining distinctive components of psychopathology and

resilience. In the present study, we do not attempt to suggest directionality of either behavioral or neurological development of resilience. We cannot ethically design methodology to do so. Also, it is not eminently relevant for future considerations and therefore not an important focus. There is a known association between altered behavior and neurobiological changes between victims of interpersonal trauma with resilience and psychopathology, and the present study seeks to further examine the ramifications of this relationship.

Behavioral contributions to resilience

The behavioral contributions to resilience are no more succinct and understood than the neurological influences. There is no strict formula for resilience because it can present differently in every person. Most simply, resilience is the capacity to cope with life's challenges and difficulties. Behavioral nuances and influences differ by individual, while core components may remain.

Most of the widely accepted theories take similar elements into account, analyzing and separating contributing factors with varying emphasis. All theories of resilience attempt to take into account individual personality components as well as social and environmental interactions although theories differ as to which is more important. Largely, however, little is known about the origin of resilience. There is a dearth of cohesive, comparative research. Baruth and Carroll (2002) designated four protective resiliency factors whose presence contributes to development of resilience against psychopathology: an adaptive personality, a supportive environment, as few as possible additional stressors and counterbalancing positive experiences. One framework theory in particular remains respected in resilience literature, taking variable individual and social factors into account. Bronfenbrenner's Process-Person-Context-Time (PPCT) bio-ecological theory of resilience emphasizes the importance of interplay between these four components (Bronfenbrenner, 1995; Williams & Nelson-Gardell, 2012). PPCT can be further

divided into proximal, or individual, and distal, or external, influences on development. In this theory, proximal traits are defined as “process” and “person.” All proximal traits are inherently personal, and fluctuate based on individual characteristics (Brofenbrenner, 1995). "Process" is defined as the interplay between a person and their environment, a proximal component that differs based on unique, personal behavior patterns. "Person" is defined as the role of individual qualities, such as personality traits, gender, race, intelligence, tenacity, or physical appearance, and is inherently proximal. Distal traits are “context” and “time.” All distal traits are external, and measure the impact that outside forces have on a person’s actions and interactions (Bronfenbrenner, 1995). "Context" is defined as the environment that causes an effect, ranging from home, school, community and religious establishments to cultural values and belief systems. "Time" is defined as the developmental period at the time of the trauma, as well as the length of time the traumatic incidences persist for throughout the course of a lifetime (Bronfenrenner, 1995). Resilience develops differently based on when trauma occurs in childhood or adulthood, and how many times a traumatic incident is endured.

For the purpose of this study, resilience will be examined by using an adapted form of Bronfenbrenner’s bioecological PPCT model. Possible contributing factors are defined, and then organized into the two proximal and distal categories. Previous research has supported Bronfenbrenner’s PPCT model as a plausible theory for resilience (Williams & Nelson-Gardell, 2012). Both individual (Agaibi & Wilson, 2005; Bonanno, 2004; Charney, 2004; DuMont, Widom, & Czaja, 2007; Maier et al., 2006; Feinauer, 2003) and social/environmental factors (Agaibi & Wilson, 2005; Bonanno, 2004; Dumont et al., 2007; Feinauer, 2003; Iwaniec, Larkin, & Higgins, 2006) have been found to positively engender resilience. Bronfenbrenner’s model takes both factors into account while strictly separating proximal and distal influences, a benefit

for any additional comparisons. There is a dearth of studies, however, specifically differentiating the depth of impact between individual or social context factors. Given the prevalence of research that focuses mostly on social/environmental factors, or mostly on individual/personality factors, without separating and comparing the two, we chose this model in an effort to examine every indicated influence without designating undue weight to one category over the other. There are no known studies that directly compare the effects of individual/personality factors to social/environmental factors in an attempt to identify prevalence, rate of development, or strength of impact on resilience.

Proximal resilience.

Individual characteristics highly affect the development of resilience over psychopathology following a traumatic incident. Werner (2000) reported that a resilient child is notoriously a child who communicates well, has good social and problem solving skills, can seek help, and believes in his/her own ability to positively impact his/her future. Other positive personality traits such as hope, optimism, self-esteem, internal locus of control, hardiness, self-efficacy, and gregariousness also contribute to resilience (Agaibi & Wilson, 2005; Bonanno, 2004; Charney, 2004; Haglund et al., 2007). Hardiness in stress literature is defined as the ability to maintain health under stress, and was first recognized as a psychological personality trait. Specifically, hardiness is achieved by a person's ability to believe he/she has a meaningful purpose in life, an internal locus of control, and that everything happens for a reason (Bonanno, 2004). High intelligence has been correlated with resilience as well, where women with a child abuse history but not psychopathology score higher on non-verbal tasks than control women or women with comorbid PTSD and child abuse history, and comparably to all three on verbal tasks

(Wingo et al., 2010). High intelligence is thought to play a part in adaptability, making the mind more elastic.

There are other individual choices and characteristics that foster resilience. Externalizing rather than internalizing blame for the trauma is denoted as particularly important. This most notably includes blaming the perpetrator of the trauma as opposed to a victim blaming his/herself (Bogar & Hulse-Killacky, 2005; Valentine & Feinauer, 1993). Resilient people may externalize distress reactions instead of internalizing them by blaming the perpetrator instead of themselves, diminishing subsequent stress reactions (Bogar & Hulse-Killacky, 2005). More generally, adults who report higher life satisfaction ratings are more resilient than adults with lower self-reported life satisfaction, even when both the satisfied and unsatisfied adults have similar trauma history. While it is difficult to discern which arises first, resilience or life satisfaction, results of Afifi and MacMillian's (2011) research suggest that certain people are predisposed to adjust to life circumstances due to adaptive coping strategies and personality traits.

A change in individual characteristics throughout maturation is also an important contributor to resilience. Temperament is considered to be a basic, inherent personality aspect that persists through all developmental stages with little alteration. Infantile temperaments and their correlations with later adolescent and adulthood personality traits or patterns of behavior have been widely studied in psychology since the mid-1900s (Degnan & Fox, 2007). For example, nuances of behavioral inhibition in infants and toddlers are correlated with later psychopathology or resilience in adolescence and adulthood. While, as discussed earlier, it is often debated whether resilience develops as a reaction to a trauma or innately predates it, temperament research lends credence to the argument that personality traits can predispose resilience from birth. Behavioral inhibition is defined as the tendency to follow a pattern of

withdrawal, avoidance, caution, fearful, and/or over-aroused behavior when presented with stimuli. Infants and toddlers who are extremely inhibited are shy, introverted, and cautious in social and unfamiliar situations (Degnan & Fox, 2007). These children are more likely to be diagnosed with social anxiety disorders than other, non-inhibited children. Adolescents and adults who were highly inhibited children are also more likely to have anxiety disorders, phobias, and poor social functioning (Degnan & Fox, 2007). Research suggests that behaviorally inhibited children are less likely to be resilient to later-life traumas due to a tendency to react negatively to novelty and a difficulty adapting. Interestingly, however, there is also evidence for instability in behavioral inhibition in the research of Degnan and Fox (2007). They reported several exceptions in temperamental development; adults and adolescents who were originally extremely inhibited toddlers and infants slowly adapted as they aged, showing less withdrawn social behavior in childhood and developing fewer anxiety disorders later in life (Degnan & Fox, 2007). These changes in temperament are a fascinating look into a personalized development of resilience, highlighting how staunch adaptive coping strategies can effect what is widely considered an innate trait.

Adaptive active coping strategies are a key element of resilience. They are indicative of several personality traits, namely motivation, internal locus of control, and optimism, as well as high intelligence (Afifi & MacMillan, 2011; Feder et al., 2009; Yehuda et al., 2006). The ability to recognize a situation and alter behavior accordingly is an important resource for resilience as it protects against fear conditioning, PTSD, anxiety disorders, and other maladaptive trauma-liked associations. Other coping strategies are related to more negative stress responses. Avoidant coping is correlated with hostility, irritability, depression, anxiety, risky behavior, bouts of anger, and/or promiscuity (Bal, van Oost, Bourdeauduij, & Crombez, 2003; Williams &

Nelson-Gardell, 2012). Avoidant coping typically involves several withdrawal tendencies, including avoidance of social situations or relationships and/or denial of emotions or memories in order to escape stress.

Distal resilience.

While individual factors are important, there are certainly elements outside of personal control that contribute to resilience. Victims who receive social support through family, community, school, therapy, and/or friends are more likely to be resilient than those who are socially isolated and remain so following a trauma (Agaibi & Wilson, 2005; Bonanno, 2004; Houshyar & Kaufman, 2005; Meyerson et al., 2002). Houshyar and Kaufman (2005) found that one of the key indicators for resilience and good development in abuse victims is a strong relationship with supportive family. Even the support of one family member may be of great influence (Werner, 2000). Open communication regarding the trauma, with understanding and encouragement, helps to foster healthy social connections and prevent isolation. Spirituality also contributes perhaps due to a belief in a greater purpose (Valentine & Feinauer, 1993).

Mobilizing resources, or being able to recognize the necessity for help, the appropriate means to summon it, and knowing when to accept it, is highly correlated with resilience (Agaibi & Wilson, 2005). Access to resources, however, as well as willingness for assistance, is also important to consider in this instance. Lower socioeconomic status (SES) families may not have the same access to familial or therapeutic resources, nor the financial security to afford mental health resources (Agaibi & Wilson, 2005; Debow et al., 1997; Felner et al., 1995). Although there are numerous contributing variables to consider, research has indicted that lower SES individuals are more at risk for psychopathology as compared to a higher SES sample with a similar trauma background (Agaibi & Wilson, 2005). Bogar and Hulse-Killacky (2006) found that poverty negatively influences resiliency. Not coincidentally, parental education level has

also been correlated with resilience as well; the more years of education a parent has completed, the more likely it is their child will be resilient. This may be due to a parental increase in intelligence, higher SES, or greater access to mental resources.

High stress levels due to financial insecurity, as well as neighborhood violence and elevated rates of revictimization, diminish the likelihood of resilience. These pressure situations offer limited coping time, as exposure to additional trauma and stress inhibit healing. A stressful home and neighborhood environment also negatively contribute to resilience development (Goldmann, Aiello, Uddin, Delva, Koenen, Gant, & Galea, 2011). A stable home environment, as well as secure attachment with parental figures, helps to foster resilience. Parenting styles have been shown to affect childhood coping styles, with secure attachment positively correlated with proactive coping following traumatic events and/or stressors. Parental modeling of poor or passive coping skills may result in a child's formation of similar patterns, therefore increasing risk for psychopathology. Secure attachment between mother and child is also indicative of resilience over psychopathology (Agaibi & Wilson, 2005; Degnan & Fox, 2007). A healthier relationship with family in the home leads to a healthier child, because the parent becomes both a good behavioral model and a support system. There are, however, copious unhealthy homes in higher SES areas, and plenty of low SES homes with healthy families. There is no reason to assume one causes another, only to recognize evidence of correlation.

Current Research

Bronfenbrenner's (1995) model, considered to be the best renowned and commonly accepted resilience model in the field, was mainly influenced by studies of children, students, and participants from high SES backgrounds, and was not created to specifically investigate the genesis of psychopathology. No known models of resilience have been constructed based on urban civilian trauma in a low SES population. Urban civilian traumas, such as child abuse,

domestic violence, and rape, are highly associated with psychopathology, including PTSD. Low SES populations are also at higher risk for psychopathology due to familial factors, such as parental absence, increased financial stress, and neighborhood violence (Agaibi & Wilson, 2005; Bogar & Hulse-Killacky, 2006). Resilience is less studied in this population, and there are no known studies specifically examining which social, individual, and/or environmental necessities engender resilience in it.

As discussed earlier, a dot-probe task, modified to include human faces, has been previously successful at measuring attention biases in people with previous interpersonal trauma history (Bryant & Harvey, 1997; Fani et al., 2012; Gibb et al., 2009; Pine et al., 2005; Wald et al., 2011). The use of emotional, representative visual stimuli strengthens the dot-probe's relevant ability to measure natural behavioral reactions to emotional stimuli. Research has also indicated known associations between attention biases, both for threatening and happy stimuli, and participants with diagnosed PTSD or anxiety disorders (Bryant & Harvey, 1997; Fani et al., 2012; Gibb et al., 2009; Pine et al., 2005; Wald et al., 2011). Two dot-probe studies have been conducted to investigate the relationship between resilience and attention bias. Both investigated the relationship between selective attention to threat and 5-HTTLPR polymorphisms. Pérez-Edgar, Bar-Haim, and colleagues (2010) examined the interplay between attention bias to threat and two specific single nucleotide polymorphisms (SNPs) on the long 5-HTTLPR serotonin allele. One SNP is an indicated risk marker for anxiety disorders, as is attention bias to threat, while the other SNP may decrease psychopathological susceptibility. During a dot-probe task modified to include happy and angry faces, Pérez-Edgar, Bar-Haim, and colleagues (2010) found elevated amygdala activation in both anxious participants and those participants genetically screened for the risk marker SNP. This signifies that a single nucleotide polymorphism (SNP)

can be related to resilience to threatening stimuli (attending away) while another SNP is correlated to attention bias towards threatening stimuli (attending towards). Kwang, Wells, and colleagues (2010) conducted a similar dot-probe task with the inclusion of emotionally valenced and neutral words instead of human faces, also examining the correlation between attention bias to threat and both the risk marker and resilience SNPs. They found that the participants genetically screened for homozygosity in the resilience SNP demonstrated attention bias away from threatening stimuli. Participants within other allele groups were not as resilient to threat, suggesting that the identified 5-HTTLPR SNP is related to a fostered resilience (Kwang, Wells, McGeary, Swann, & Beevers, 2010). No other known dot-probe tasks have been conducted to specifically consider the attention bias patterns indicative of resilience.

Although there are few known dot-probe tasks examining attention bias to happy stimuli, there is a significant behavior pattern (Fani, Bradley-Davino, Ressler, & McClure-Tone, 2011. Participants with PTSD indicate biases towards happy faces in a modified dot-probe task that includes neutral, fear, and happy human faces (Fani et al., 2011). Happy bias is important to consider when studying resilience. Patterns of healthy behavioral reactions to happy, friendly faces, as well as an appropriate discernment between fear/threat and happy faces, may be related to resilience development. Bonanno (2004) states that positive emotions foster healthy coping after a traumatic event, suggesting that resilience development is more likely if positive emotions are more prevalent.

In the current research, components of resilience are subdivided by individual/personality (proximal) and social/environmental (distal) based on Bronfenbrenner's PPCT model in order to investigate how each division affects both development and attention bias and whether resilience can exist if only one component is present. We hypothesize the development of resilience

following childhood abuse will be significantly different when considering proximal factors and distal resilience factors. We also predict that resilience will correlate with attention for happy stimuli and for threat stimuli in a dot-probe task. It is also expected that there will be difference in attention bias on the dot-probe task when separating by subcategories, i.e, proximal and distal factors. Although there is an absence of specific prior support, our substantiated postulation is stronger levels of distal resilience will attend towards happy faces due to the influence of positive social support. Proximal resilience will attend away from happy faces, as compared to distal resilience, because positive personality traits and intrinsic motivation exist independent of social cues.

Methods

Participants

A total of 247 adult females aged 18-69 (M = 40.24, SD =12.77) were recruited courtesy of a larger NIMH funded parent study of psychopathology risk and resilience from a public urban hospital in Atlanta. All participants were approached in one of two general medical clinics in the hospital, obstetrics/gynecology and primary care, handle non-emergency medical conditions for inner-city economically disadvantaged patients. Previous studies have found that this population reports a higher prevalence of interpersonal trauma and psychopathology, including posttraumatic stress disorder (PTSD) (Khoury, Tang, Bradley, Cubells, & Ressler, 2010). The increase in symptomology is indicative of both the patients at this clinic and other inner-city samples reporting urban civilian traumas (Goldmann et al., 2011). The majority of recruited patients in the Grady Trauma Project parent study are African American (85.8%) and 66.4% are female. For the purpose of this research, only female African Americans are involved in the sample. Analyses from the dot-probe attention bias task consist only of African American female face pairs in order to prevent against between-race effects and control for gender, and

therefore, only African American females were included. One hundred and thirty-three people completed the dot-probe task as well as all necessary behavioral measures, and 6.5% (16 participants) were excluded due to either administrative or technological error on the dot-probe task. All analyses were run on these 133 participants. Table 1 provides sample demographics.

Participants were administered the Modified PTSD Symptom Scale (MPSS; Foa, Riggs, Dancu, & Rothbaum, 1993) to consider the presence of current DSM-IV diagnostic PTSD. 83 (35.9%) participants were PTSD+. All participants had a previous history of childhood abuse, as measured by the Childhood Trauma Questionnaire (CTQ; Bernstein, Fink, Handelsman, & Foote, 1994). Assessment selection and descriptions are discussed further below. The aggregate degree of abuse (sexual, emotional, physical, or a combination) differed among participants. Many had experienced or witnessed additional traumas, while interpersonal traumas are the most commonly reported in this population (Khoury et al., 2010).

During the screen and initial assessment, researchers evaluated patients for several exclusion criteria include: previous stroke or neurological complications, un-medicated bipolar disorder or schizophrenia, a lack of mental aptitude (mental retardation or dementia), current illegal drug use, prior participation, and/or a history of loss of consciousness, coma, or head injury. Several of these exclusion criteria are specific to the dot-probe, while others are for the clinical assessment.

Procedure

Institutional Review Boards from both Emory and Georgia State Universities approved study procedures. Participants were approached by trained Grady Trauma Project researchers in either of the two aforementioned general medical clinic locations. Grady Trauma Project consists of a large research team, including the current author, all of whom contributed to data collection and entry. Study researchers verified whether patients were eligible for participation

based on an ability and desire to understand English and give informed consent during preliminary screening procedure. The initial screen, which consists of several psychological measures detailing childhood and adulthood trauma history as well as current emotional pathology, takes approximately one to two hours to complete. Measures administered include the Traumatic Events Inventory (TEI), Beck Depression Inventory (BDI; Beck, Steer, Ball, & Ranieri, 1996), Childhood Trauma Questionnaire (CTQ; Bernstein et al., 1994), and the Modified PTSD Symptom Scale (MPSS; Foa et al., 1993), each discussed in greater detail below. Participants are monetarily compensated fifteen dollars for their time, independent of completion. Clinical assessments were conducted during a separate appointment at the Grady Trauma Project lab, and the dot-probe task was also conducted during a follow-up appointment outside of the hospital. Clinically trained researchers from the Grady Trauma Project conducted the clinical interviews and dot-probe task, most of who were not involved in initial data collection. The current author was not clinically trained to assist in these assessments.

Measures

In the initial screen, participants completed several psychological measures that assess a variety of criteria from childhood trauma history to baseline psychopathology and emotion behavior patterns. Where possible, we used the instrument most widely supported by the literature.

Psychopathology criteria.

Several measures were given to assess the diagnostic presence, as well as the severity, of current psychopathology. Full measures may be further viewed in either Appendix A or Appendix B. The Beck Depression Inventory (BDI-II; Beck et al., 1996) was administered to determine depressive symptomology over the past two weeks. It contains 21 items and is a self-

reported measure scored by severity, where higher values indicate more severe depression. It has good internal consistency, with Cronbach's α= .91 (Beck et al., 1996).

The Modified Posttraumatic Stress Symptom Scale (MPSS; Foa et al., 1993) determines PTSD per DSM-IV diagnostic criteria. It includes 17 items that inquire as to PTSD symptoms over the past two weeks, when symptoms include re-experiencing, avoidance/numbing, and hyperarousal. An additional question is included to measure the duration of PTSD symptoms. The MPSS has good internal consistency, with Cronbach's α= .91 (Foa et al., 1993). For the purpose of this study and per DSM-IV criteria, a participant is considered PTSD+ if he/she endorses one or more re-experiencing symptom, three or more avoidance/numbing symptoms, two or more hyperarousal symptoms, and indicates that these PTSD symptoms have lasted for three or more months' time.

Trauma history.

In the initial screen, childhood abuse history was considered by the Childhood Trauma Questionnaire (CTQ; Bernstein et al., 1994), a 25 item self-report measure to note the frequency and persistence of experienced sexual abuse, emotional abuse, and/or physical abuse. Similar to previous research, CTQ cut-offs were as follows: low/moderate emotional abuse (8-11), medium emotional abuse (12-15), high emotional abuse (16+); low/moderate physical abuse (7-8), medium physical abuse (9-12), high physical abuse (13+); low/moderate sexual abuse (5-6), medium sexual abuse (7-12), high sexual abuse (13+) (University of Sydney, NSW Department of Juvenile Justice (DJJ) & Justice Health). There is high internal consistency for all factors (emotional, physical, and sexual abuse) with Cronbach's α ranging from 0.79-0.94 (Bernstein et al., 1994). Participants, based on these criteria, were classified as experiencing low/minimal, moderate, or high childhood abuse trauma in each of those three criteria, as well as a total childhood trauma index. The full measure is available in Appendix C.

The Traumatic Events Inventory (TEI) was created for use by the Grady Trauma Project and was also conducted during the initial screen. The TEI examines the types of trauma experienced and their frequency across a participants' lifetime. These include interpersonal traumas, as well as accidents, sudden illness, and/or the witnessing or confrontation of a loved ones' murder. The TEI details both childhood abuse as well as adulthood abuse, and trauma exposure during each time period can be calculated separately. As seen in previous research, total trauma exposure is gauged by the number of different types of traumatic events a participant indicates he/she has experienced (Fani et al., 2011; Gillespie, Bradley, Mercer, Smith, Connelly, Gapen, Weiss, Schwartz, Cubells, & Ressler, 2009). The full survey is available in Appendix D.

Resilience criteria.

Bronfenbrenner's PPCT model of resilience was used as a model for this research. During the initial screen, several measures were given detailing individual and environmental components of resilience. The Connor-Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003) was also administered in order to assess composite resilience scores. The CD-RISC is comprised of 25 self-rated items on a 0-4 Likert scale, when higher scores indicate greater resilience. It has good test-retest reliability, and Cronbach's α=.89 (Connor & Davidson, 2003). It is presented in Appendix E.

Both study-determined proximal and distal components of resilience were compared to participants' CD-RISC scores to establish significance and validity. Proximal resilience is significantly related to CD-RISC scores (as seen in Table 2*)* indicating that proximal resilience is a statistically valid measure of resilience. Full proximal resilience measures are presented in Appendices F, G, and H. Distal resilience is significantly related to CD-RISC scores (as seen in

Table 3*)* indicating that proximal resilience is a statistically valid measure of resilience. Appendices I and J contain full distal resilience measures.

Proximal resilience.

Proximal resilience is defined as the effects of person-specific traits or influences on resilience. Three measures from the initial screen assessing individual emotion response and coping processes appraise proximal resilience. These measures are the Emotional Dysregulation Scale (EDS), a subscale of the Social Cognition and Object Relations Scale (SCORS; Westen, Lohr, Silk, Kerber, & Goodrich, 1990) and the PANAS (Positive Affect Negative Affect Scale; Thompson, 2007). Each of the three measures included in proximal resilience had a variance inflation factor (VIF) less than ten during multi-collinearity analyses, showing that multi-collinearity was not a factor when creating this construct.

The Emotion Dysregulation Scale (EDS) is a 24-item self-report measure, of which 12 items were included on the specified short form for use during compressed timing. The EDS assesses emotion regulation and dysregulation, and is rated on a 1 (*not true at all*) to 7 (*very true*) Likert scale. Questions ask participants to consider how different items describe their emotional patterns, including but not limited to "it is often hard for me to calm down when I'm upset," "when I'm upset, I have trouble solving problems," and "when I'm upset, I have trouble seeing or remembering anything good about myself."

The Positive Affect Negative Affect Scale (PANAS) is a 20-item self-report measure of positive and negative affect rated as 1 (*very slightly/not at all*) to 5 (*extremely*). Participants rate themselves with presented adjectives, such as "enthusiastic" "interested" and "hostile." It has good internal consistency, with Cronbach's $\alpha = .93$, and test-retest reliability of positive affect at .84 ($p < .01$). Multi- collinearity scores restricted the use of both scales due to a high VIF, and prior research has indicated that positive affect scores are reliable measures of depression and

anxiety. A contrast would be of interest for current resilience research. For the purpose of this study, only positive affect scores were used (Thompson, 2007).

Social Cognition and Object Relations Scale (SCORS; Westen et al., 1990) is an eight item measure of an individual's understanding of how he/she responds to and is affected by social relationships. Participants rate themselves on a scale of 1 (*low*) to 7 (*high*) on questions such as "emotional investment in values and moral standards," "emotional investment in relationships," and "self-esteem." Self-esteem is reported as 1 (*views self as loathsome, evil, or generally rotten*) to 7 (*tends to have realistically positive feelings*) with 3 (*low self-esteem or displays grandiose perceptions*) and 5 (*range of positive and negative emotions*) notably more moderate. Substantial reliability and validity data were supported in prior research (Ackerman, Clemence,Weatherill,& Fowler, 2000).

Distal resilience.

Distal resilience is defined as external influences on the development of resilience. Two measures assess distal resilience, one administered during the initial screen and one given during a clinical assessment at a later date. These measures include the Clinical Data Form (CDF) and the Life Base Inventory (LBI). Only two subscales of the CDF were included: stability/warmth within the entire family, and stability/warmth only with a maternal figure. Similarly, only two items from the LBI were integrated: Global Assessment of Satisfaction (GAS) and Global Social Adjustment (GSA). Each of these four components included in distal resilience had a variance inflation factor (VIF) less than ten during multi-collinearity analyses, showing that multi-collinearity was not a factor when creating this construct. Other subscales were considered but later excluded due to multi-collinearity. CDF subscales, including instability, which measures alcohol and drug abuse as well as familial arrest history, were excluded, as were GAS measures of recreation and satisfaction with interpersonal familial relationships.

The Clinical Data Form (CDF) is a 22 item self-report measure of perceived warmth, stability, substance abuse, and affection from parental figures and in the childhood home. On twelve questions, participants rate themselves on a scale of 1 *(very unstable, poor relationship, or not at all)* to 5*(very stable, warm relationship, or most of the time).* The two selected subscales were chosen to demonstrate possible affective differences between composite home ratings and individual maternal figure ratings. Questions ask participants to indicate feelings of support and affection for primary caregivers, as well as those emotions they felt a primary caregiver had towards them, during their childhood.

The Life Base Inventory is a semi-structured interview assessing current functioning in multiple domains. Items include questions relating to Global Assessment of Satisfaction (GAS) and Global Social Adjustment (GSA). The Global Assessment of Satisfaction (GAS) assesses a participant's overall satisfaction with his/her social commitment to different relationships, degree of fulfillment, and gratification from recreational activities in the past month. It is self-report and rated 1 (*satisfied)* to 5 (not *satisfied*). Global Social Adjustment (GSA) is an interviewer-report question, taking into account everything previously learned in the interview about education, functioning ability at work, relationships and sexual activity before assessing the participant's level of social adjustment over the past month.

Dot-probe task.

The dot-probe task (Mogg & Bradley, 1999) is a computer-based behavioral task that assesses selective attention to emotional or neutral stimuli by requiring participants to rapidly respond to a cue during the presentation of either emotional or neutral stimuli. Further details concerning specific task procedure are presented in Fig. 1, and the structure of the task is discussed in more detail earlier in this paper.

Dot-probe analyses.

Scores for emotion bias were calculated by subtracting response time to emotion-incongruent stimuli (when fixation cross replaces neutral facial photographs) from response time to emotion-congruent stimuli (when fixation cross replaces emotional facial photographs, either threatening or happy). The formula presents as:

Emotion Bias = response time (emotionally valenced photograph) - response time (neutral photograph)

Positive emotion scores indicate attention bias towards the designated emotion (threat or happy), while negative emotion bias scores indicate attention bias away from the designated emotion (threat or happy).

Emotion bias scores were further segmented into subtypes, including composite threat and happy bias scores as well as separate happy and threat bias scores for both African American and Caucasian faces. For the purpose of this research, only African American face pairs were considered in analyses to prevent between-race effects.

Results

Analyses revealed the relationship between proximal and distal resilience, childhood abuse, and attention bias. We hypothesized that childhood abuse would be more significantly related to proximal resilience than distal resilience. We also hypothesized that resilience would correlate with attention bias for happy and threatening stimuli, and that this relationship would differ between proximal and distal resilience constructs. Distal resilience would predict attention bias towards happy faces while proximal resilience predicts attention bias away from happy faces.

Resilience constructs.

Correlations between measures of proximal resilience are presented in Table 2. As predicted, all proximal resilience measures were significantly correlated indicating strength

within the construct. Proximal resilience also significantly correlates with the CD-RISC, signifying that this construct measures a subcomponent of resilience.

As predicted, all distal resilience measures were significantly correlated thus demonstrating a unified construct. Correlations are presented in Table 2. A significant correlation is also present between distal resilience and the CD-RISC, indicating that this construct measures a subcomponent of resilience. Correlations are presented in Table 3.

A one-way ANOVA revealed that type of resilience differed across severity of childhood abuse ($F_{(2,132)} = 4.97$, $p = .008$). A post-hoc Tukey HSD showed that participants who reported the most severe childhood abuse have a larger proximal-to-distal resilience ratio than participants with the lowest reported childhood abuse ($p = .007$). There was no significant difference between moderate reported childhood abuse and either most severe or lowest childhood abuse on the proximal-to-distal resilience ratio. These results are further displayed in Fig. 2. A one-way ANOVA revealed that resilience as measured by the CD-RISC significantly differed across severity of childhood abuse, although a post-hoc Tukey HSD revealed no significant differences between lowest, moderate, and most severe reported childhood abuse ($F_{(2,139)}$, $p = .034$).

Attention bias.

A three-step linear regression including possible confounds, proximal resilience and distal resilience was not a significant predictor of attention bias for threat stimuli. Confounds included total trauma exposure, childhood abuse, PTSD, and depression. Total trauma exposure, childhood abuse, PTSD, and depression each did not significantly predict attention bias for threat stimuli, and accounted for a minimal proportion of variance in threat bias scores (Total trauma exposure, $\beta = .135$, $t(120) = 1.26$, $p = .208$; childhood abuse, $\beta = -.137$, $t(120) = -1.215$, $p = .227$; PTSD, $\beta = .101$, $t(120) = .776$, $p = .439$; depression, $\beta = -.025$, $t(120) = -.210$, $p = .834$). A three-step linear regression including possible confounds, proximal resilience and distal

resilience, also was not a significant predictor of attention bias for happy stimuli. None of the confounds significantly predicted attention bias for happy stimuli, and accounted for a minimal proportion of variance in threat bias scores (Total trauma exposure, $\beta = -.048$, $t(120) = -.452$, $p = .652$; childhood abuse, $\beta = -.093$, $t(120) = -.824$, $p = .412$; PTSD, $\beta = .039$, $t(120) = .297$, $p = .767$; depression, $\beta = .090$, $t(120) = .760$, $p = .449$). Neither adding proximal resilience measures in step two nor distal resilience measures in step three increased the model fit for either happy or threat bias, as presented in Table 4 and Table 5 respectively. Resilience as measured by the CD-RISC was not significantly correlated with threat bias ($r(131) = -.039$, $p = .645$) or happy bias ($r(131) = .012$, $p = .885$).

Discussion

The present study was constructed to investigate behavioral differences in selective attention to happy and threatening emotional stimuli between two components of resilience, both proximal and distal resilience, through the administration of a modified dot-probe task. Some findings from this study did not support *a priori* hypotheses, although distinct significant differences between proximal and distal resilience were observed. The development of resilience following childhood abuse was significantly different when considering proximal factors and distal factors. Severe childhood abuse is strongly related to proximal resilience over distal resilience, indicating that resilient people with severe childhood abuse histories are more likely to be proximally resilient than distally resilient. These results supported the initial hypothesis. While prior research shows that PTSD predicts attention bias towards happy stimuli, a relationship has not been found between happy bias and resilience (Fani et al., 2011). Neither proximal nor distal resilience components were significantly related to happy bias in the dot-probe attention bias task. These findings are contrary to the *a priori* hypothesis that subcomponents, proximal and distal resilience, will differ in regards to attention bias to

emotional (happy and threat) stimuli. There was no significant support for a directional attention bias difference between proximal and distal resilience. Proximal and distal resilience do not predict attention biases for happy or threatening stimuli. Resilience as determined by the Connor-Davidson Resilience Scale (CD-RISC), a common measure of resilience in psychological research, also displayed no predictive attention bias relationship with happy or threatening stimuli.

These results suggest that selective attention either towards or away from emotional human faces is not an indicator of resilience. Prior research establishes that people with active psychopathology such as PTSD respond significantly to a modified dot-probe task, indicating specific orienting attention styles. Fani and colleagues (2012) found that participants with PTSD attend towards threatening stimuli while Pine and colleagues (2005) determined that PTSD participants attend away from threatening stimuli. Findings have also shown that participants with PTSD attend towards happy faces (Fani et al., 2011). Resilience, however, does not display equivalent orientation patterns. There is no clear attention style for resilient participants. Given that resilient people are known to respond differently to emotion than others with psychopathology, a disparity of behavioral reactions between the two was expected in the current study. But, current research demonstrates that attention orientation for threat or happy stimuli is not related to resilience. This result is surprising, however, because positive emotion has been denoted as a healthy coping mechanism following traumatic stress, which suggests that resilient people would orient towards happy faces (Bonanno, 2004).

One possible explanation for our findings is neurobiological, while the other is behavioral. There is not a strict division between the two, but the first explanation leans heavier on neurobiology while the second relies more on behavioral factors.

Considering the motivation behind the selection of the dot-probe task helps to illustrate a neurobiological reason for the current disparity between results and hypotheses. During this behavioral attention bias task, the mind is directed to make decisions and consider emotional stimuli using both emotion regulation and impulsivity neural networks. In a resilient person, an efficient medial prefrontal cortex (mPFC) inhibits amygdala activity, which decreases the risk for a hyperreactive amygdalae-hippocampal connection. This subsequently reduces the prevalence of enhanced emotionally valenced memory consolidation. An appropriately functional anterior cingulate cortex (ACC) both facilitates emotion regulation and effective, appropriate decision making in emotion-salient scenarios. A resilient person is also less likely to have a smaller volume hippocampus, due to less stress-induced glucocorticoid damage and/or genetic risk, and increasing the likelihood of healthy emotion regulation. A healthy ventromedial prefrontal cortex (vmPFC) would lessen a resilient person's likelihood of responding impulsively to emotional stimuli, including overgeneralizing fear to threatening faces or improperly discriminating between emotions (either neutral, happy, or threatening) due to a hyperreactive stress sensitization. Neurobiology then suggests that, when presented with emotional stimuli during a selective attention task, resilient people would be able to regulate emotive reactions to that emotion (happy or threatening) and control responses following the stimuli's presentation. They do not attend towards or away from either threatening or happy faces because resilient people have not needed to develop a specifically orienting attention style in order to adapt to their traumatic experience. Resilience has been associated with keeping a narrow view of an individual trauma, or avoidance of overgeneralizing from one context to another (Charney, 2004; Haglund et al., 2007). The learned patterns that form during fear conditioning require the brain to connect or generalize from one specific context to another larger one. Resilient people are

less prone to doing so, and are therefore less susceptible to making these associations. Considering that fear conditioning has been indicated as a contributor to the development of phobias, panic disorders, anxiety disorders, and PTSD, invulnerability against it appears a key indicator of resilience. In general, stress resilience has been related to a greater aptitude for emotion regulation (Degnan & Fox, 2007; Feder et al., 2009). Proficient emotional regulation could indicate control over fear as well as a decreased susceptibility to fear conditioning. When presented with emotional stimuli on the dot-probe task, resilient participants did not overgeneralize from previous experiences, traumatic or otherwise.

In sum, it is possible that current findings differed from an *a priori* hypothesis because healthy relations between a correctly functioning ACC and mPFC, an appropriately normal hippocampus, and an efficient vmPFC and ACC, facilitate protection from fear conditioning effects in resilient people. Healthy emotion regulation and/or controlled decision making during emotion-based tasks negates the need for a pattern of attention bias in any direction.

Another possible explanation for current findings is entrenched in behavioral nuances. Proximal and distal resilience components were not related to attention bias, signifying that neither people with proximal resilience nor people with distal resilience displayed significant attention bias patterns for threatening or happy stimuli. Both proximal and distal resilience are subcategories of *why* a person is resilient. Proximal resilience signifies that personality traits such as optimism, internal locus of control, and hardiness increase likelihood for the development of resilience over psychopathology (Agaibi & Wilson, 2005; Bonanno, 2004; Charney, 2004; Haglund et al., 2007). Distal resilience implies that external factors such as a stable socio-economic or financial state, social functioning, and support from family, friends and/or community, fosters resilience rather than psychopathology (Agaibi & Wilson, 2005;

Bonanno, 2004; Houshyar and Kaufman , 2005). Proximal and distal resilience, then, account for why resilience develops in the place of psychopathology. The current presentation of resilience, or *how* an individual is resilient, may be significantly predictive of attention bias. Studying differences in coping patterns following trauma may highlight correlating disparities in selective attention biases. Prior results have emphasized different coping methods used by resilient people. Some resilient people have adapted avoidant coping styles, and maintain the perception of healthy resilience through repression or withdrawal from negative emotions. People can present as resilient while maintaining avoidant coping methods through self-medication (substance abuse), purposeful detachment from emotional memories, and/or rehearsed habituation (Bal et al., 2003; Williams & Nelson-Gardell, 2012). Emotional distress is then masked, so much so that avoidant coping people can be referred to as having "dormant effects;" it is possible even they are unaware of the extent of their emotional unease (Bal et al., 2003). Another observed coping method would be considered a positive, problem-solving coping strategy. Dumont and Provost (1999) found, through studying depressive, coping, and resilience patterns in adolescents, that strong problem-solving coping strategies were correlated with resilience. Problem-solving coping is explained as the ability to both anticipate the stress that may arise from a problem as well as the appropriate method for dissipating that stress or coping with any unavoidable negative consequences. While people who rely on avoidant coping methods to maintain emotional stability may be considered resilient, it is important to consider how the difference between maladaptive coping methods and healthy coping methods affects behavioral patterns. The *why* between these two subcategories may be the same in both proximal and distal directions, but the *how* is distinct. Resilient people who use avoidant coping strategies and those who use problem-solving strategies respond distinctly in emotional situations. These

differences may relate to behavioral responses during presentation of emotional stimuli; resilient people who rely on avoidant coping strategies may treat threatening images differently than those people who use problem-solving techniques.

In summary, current findings may have differed from hypotheses because proximal and distal components of resilience account for *why* resilience developed, which is not descriptive when considering behavioral patterns. In order to illustrate differences among people with resilience in terms of attention orienting patterns to emotional stimuli (threatening or happy), it is important to consider *how* a person is resilient.

The present data did support the hypothesis that there would be significant differences in the development of proximal over distal resilience following childhood abuse. The difference lies at the extremes. Participants with severe childhood abuse histories displayed more proximal resilience than distal resilience, as well as more proximal resilience than those participants with a lower childhood abuse history. Given that resilience as measured by the CD-RISC does not differ between levels of childhood abuse severity, all participants are equally resilient. The amount or level of resilience does not differ, but rather, the type of resilience present. Prior research provides explanations to why distal resilience is less pronounced. Agaibi and Wilson (2005) indicated specific environmental risks that decrease the likelihood of resilience. Exposure to neighborhood violence, increased pressures from lower SES financial strain, and difficulty accessing supportive resources can detrimentally affect distal resilience (Agaibi & Wilson, 2005; Debow et al., 1997; Felner et al., 1995). An urban civilian trauma population is at increased risk for several of these suggested negative effects on distal resilience. Higher rates of neighborhood violence, lower SES status, and an increased familial and personal incarceration history were shown in previous findings with a similar population (Bogar & Hulse-Killacky, 2006; Goldmann

et al., 2011). The sample in the current study displayed similar demographic patterns. Developing distal resilience in a sparsely supportive environment would be difficult, and supports current findings. Results suggest that proximal resilience is more likely to be fostered after severe childhood abuse because of an increased reliance on individual traits. Severe childhood abuse could indicate a maladaptive home environment, including dysfunctional relationships with caregivers or other potential adult abusers, as well as a lack of social and environmental support. Developing resilience would then necessitate strong individual characteristics that allow an individual to persevere despite, or perhaps in spite of, other life factors.

There are several notable study limitations. While proximal and distal variables are significant measures of resilience, content validity could be strengthened. Several measures were selected, both from the self-report initial screen and the semi-structured clinical interview, to account for contributors to proximal and distal resilience. Proximal and distal resilience constructs might not fully measure as anticipated or preferred because the measures were not specifically designed for this designated purpose. Future research would benefit from either more explicit measures, clearly directed for measuring proximal and distal resilience, or more demonstrative combinations of measures. The dot-probe task, in addition, could benefit in the future from including male faces. Only female faces were included, and female participants in order to limit gender effect, but future research could benefit by cross-examining emotion reaction differences between and within genders. Studying later effects of male-to-female trauma may be strengthened by this approach. Also, due to the retrospective nature of this study, we were not able to account for the amount of time that had passed between a traumatic event occurring and participating in our study. This prevented the full use of Bronfenbrenner's

Process-Person-Context-Time (PPCT) resilience model, which discusses how the passage of time affects resilience. Future research would benefit from prospective and/or longitudinal studies that account for progression, or lack thereof, in resilience over time, as well as to determine the specific onset of behavioral and neurobiological differences between resilient and psychopathological people.

This is the first known study to examine associations between childhood abuse, resilience subcomponents, and attention bias. Neither proximal nor distal resilience predicts orienting attention patterns for emotional stimuli, at least in this study, conceivably due to healthy neural circuitry that maintains balanced emotion regulation and control patterns when presented with emotional stimuli. This is also the first known study to suggest the necessity for differentiating between *why* resilience develops and *how* it is used when predicting behavioral tasks. Future research may benefit from using selective attention tasks to classify resilience over psychopathology, as well as to discriminate between different coping methods. Therapeutic techniques could also benefit from recognizing behavioral patterns in resilient people. Early targeting of resilience tendencies, as well as propensities for maladaptive or problem-solving coping patterns, could be instrumental for effectively preventing the development of psychopathology.

More severe childhood abuse demonstrates a significantly different pattern of development between proximal and distal resilience constructs, when more severe childhood abuse indicates a greater likelihood for proximal resilience. Further studies can benefit from considering the acquisition vs. vulnerability hypothesis, and examining whether proximal resilience can be fostered to decrease psychopathological risk or if resilience is derived from predisposed personality components. Identifying specific threats to distal resilience would be

valuable as well, in order to increase distal resilience development and strength community and social ties and support networks.

It is important to note that results and the above possible explanations suggest that resilient people display noticeably different behavioral patterns from people with PTSD, indicating that resilient people are not just traumatized people who do not have PTSD. They are a separate grouping, and further research into resilience vs. vulnerability ought to highlight distinctive variances and similarities within resilience as an independent entity.

References

Ackerman, S., Hilinsroth, M., Clemence, A., Weatherill, R., & Fowler, C. (2000). The effects of social cognition and object representation on psychotherapy continuation. *Bulletin of the Menninger Clinic, 64,* 386-408.

Afifi, T. O., & MacMillan, H. L. (2011). Resilience following child maltreatment: A review of protective factors. *The Canadian Journal Of Psychiatry / La Revue Canadienne De Psychiatrie, 56*(5), 266-272.

Agaibi, C.E., & Wilson, J.P. (2005). Trauma, PTSD, and Resilience : A Review of the Literature. *Trauma Violence Abuse, 6*, 195. doi: 10.1177/1524838005277438.

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, DC: American Psychiatric Association.

Antelman, S. M., & Brown, T. S. (1972). Hippocampal lesions and shuttlebox avoidance behavior: A fear hypothesis.*Physiology & Behavior, 9*(1), 15-20. doi:10.1016/0031-9384(72)90257-0.

Armony, J. L., & Dolan, R. J. (2002). Modulation of spatial attention by fear-conditioned stimuli: An event related fMRI study. *Neuropsychologia, 40*, 817-826.

Bal, S., van Oost, P., de Bourdeaudhuij, I., & Crombez, G. (2003). Avoidant coping as a mediator between self-reported sexual abuse and stress-related symptoms in adolescents. *Child Abuse & Neglect, 27*(8), 883-897. doi:10.1016/S0145-2134(03)00137-6.

Banich, M. T., Mackiewicz, K. L., Depue, B. E., Whitmer, A. J., Miller, G. A., & Heller,

W. (2009). Cognitive control mechanisms, emotion and memory: A neural perspective with implications for psychopathology. *Neuroscience And Biobehavioral Reviews, 33*(5), 613-630. doi:10.1016/j.neubiorev.2008.09.010.

Baruth, K. E., & Carroll, J. J. (2002). A formal assessment of resilience: The Baruth Protective Factors Inventory. *The Journal of Individual Psychology, 58,* 235–244.

Beck, A.T, Steer, R.A., Ball, R., Ranieri, W. (1996). Comparison of Beck Depression Inventories -IA and -II in psychiatric outpatients. *Journal of Personality Assessment, 67* (3): 588–97. doi:10.1207/s15327752jpa6703_13.

Bentley, T., & Widom, C. S. (2009). A 30-year follow-up of the effects of child abuse and neglect on obesity in adulthood. *Obesity, 17*(10), 1900-1905. doi:10.1038/oby.2009.160.

Bernstein, D. P., Fink, L., Handelsman, L., & Foote, J. (1994). Initial reliability and validity of a new retrospective measure of child abuse and neglect. *The American Journal of Psychiatry, 151*(8), 1132-1136.

Bogar, C. B., & Hulse-Killacky, D. (2006). Resiliency determinants and resiliency processes among female adult survivors of childhood sexual abuse. *Journal of Counseling & Development, 84*(3), 318-327. doi:10.1002/j.1556-6678.2006.tb00411.

Bonanno, G. A. (2004). Loss, Trauma, and Human Resilience: Have We Underestimated the Human Capacity to Thrive After Extremely Aversive Events?. *American Psychologist, 59*(1), 20-28. doi:10.1037/0003-066X.59.1.20.

Bonne, O., Brandes, D., Gilboa, A., Gomori, J., Shenton, M. E., Pitman, R. K., &

Shalev, A. Y. (2001). Longitudinal MRI study of hippocampal volume in trauma survivors with PTSD. *The American Journal Of Psychiatry, 158*(8), 1248-1251. doi:10.1176/appi.ajp.158.8.1248.

Bremner, J. (2001). Hypotheses and controversies related to effects of stress on the hippocampus: An argument for stress-induced damage to the hippocampus in patients with posttraumatic stress disorder. *Hippocampus, 11*(2), 75-81. doi:10.1002/hipo.1023.

Bremner, J. D. (2007) Functional neuroimaging in post-traumatic stress disorder. *Expert Rev Neurother7*: 393-405.

Bremner, J., Randall, P., Vermetten, E., & Staib, L. (1997). Magnetic resonance imaging-based measurement of hippocampal volume in posttraumatic stress disorder related to childhood physical and sexual abuse: A preliminary report. *Biological Psychiatry, 41*(1), 23-32. doi:10.1016/S0006-3223(96)00162-X.

Bremner, J., Narayan, M., Staib, L. H., Southwick, S. M., McGlashan, T., & Charney, D. S. (1999). Neural correlates of memories of childhood sexual abuse in women with and without posttraumatic stress disorder. *The American Journal of Psychiatry, 156*(11), 1787-1795.

Bremner, J., Vythilingam, M., Vermetten, E., Southwick, S. M., McGlashan, T., Nazeer, A., & ... Charney, D. S. (2003). MRI and PET study of deficits in hippocampal structure and function in women with childhood sexual abuse and posttraumatic stress disorder. *The American Journal of Psychiatry, 160*(5), 924-932. doi:10.1176/appi.ajp.160.5.924.

Bronfenbrenner, U. (1995). Developmental ecology through space and time: A future

perspective. In P. Moen, G. r. Elder, K. Lüscher (Eds.) *Examining lives in context: Perspectives on the ecology of human development* (pp. 619-647). Washington, DC US: American Psychological Association. doi:10.1037/10176-018.

Brown, P. J., & Wolfe, J. (1994). Substance-use and posttraumatic stress disorder comorbidity. *Drug and Alcohol Dependence, 35*, 51–59.

Browne, A., & Finkelhor, D. (1986). Impact of child sexual abuse: A review of the research. *Psychological Bulletin, 99*(1), 66-77. doi:10.1037/0033-2909.99.1.66.

Carpenter, L. L., Tyrka, A. R., Ross, N. S., Khoury, L., Anderson, G. M., & Price, L. H. (2009). Effect of childhood emotional abuse and age on cortisol responsivity in adulthood. *Biological Psychiatry, 66*(1), 69-75. doi:10.1016/j.biopsych.2009.02.030.

Carpenter, L. L., Carvalho, J. P., Tyrka, A. R., Wier, L. M., Mello, A. F., Mello, M. F., & ... Price, L. H. (2007). Decreased adrenocorticotropic hormone and cortisol responses to stress in healthy adults reporting significant childhood maltreatment. *Biological Psychiatry, 62*(10), 1080-1087. doi:10.1016/j.biopsych.2007.05.002.

Chambers, E., & Belicki, K. (1998). Using sleep dysfunction to explore the nature of resilience in adult survivors of childhood abuse or trauma. *Child Abuse & Neglect, 22*(8), 753–758.

Chandy, J. M., Blum, R. W., & Resnick, M. D. (1996). Gender specific outcomes for sexually abused adolescents. *Child Abuse & Neglect, 20*(12), 1219–1231.

Charney, D.S. (2004). Psychobiological mechanisms of resilience and vulnerability: Implications for successful adaptation to extreme stress, *Am J Psychiatry, 161*, 195-216. 10.1176/appi.ajp.161.2.195.

Clark, L. L., Bechara, A. A., Damasio, H. H., Aitken, M. F., Sahakian, B. J., & Robbins,

T. W. (2008). Differential effects of insular and ventromedial prefrontal cortex lesions on risky decision-making. Brain: A Journal of Neurology, 131(5), 1311-1322. doi:10.1093/brain/awn066.

Connor, K. M., & Davidson, J. T. (2003). Development of a new resilience scale: The Connor-Davidson Resilience Scale (CD-RISC). *Depression and Anxiety, 18*(2), 76-82. doi:10.1002/da.10113.

Cutajar, M. C., Mullen, P. E., Ogloff, J. P., Thomas, S. D., Wells, D. L., & Spataro, J. (2010). Psychopathology in a large cohort of sexually abused children followed up to 43 years. *Child Abuse & Neglect, 34*(11), 813-822. doi:10.1016/j.chiabu.2010.04.004.

Davis, M., Falls, W. A., Campeau, S., & Kim, M. (1993). Fear-potentiated startle: A neural and pharmacological analysis. *Behavioural Brain Research, 58*(1-2), 175-198. doi:10.1016/0166-4328(93)90102-V.

De Bellis, M. D., Spratt, E. G., & Hooper, S. R. (2011). Neurodevelopmental Biology Associated with Childhood Sexual Abuse. *Journal of Child Sexual Abuse, 20*(5), 548-587. doi:10.1080/10538712.2011.607753.

Degnan, K., & Fox, N. A. (2007). Behavioral inhibition and anxiety disorders: Multiple levels of a resilience process. *Development and Psychopathology, 19*(3), 729-746. doi:10.1017/S0954579407000363.

Diamond, D. M., & Ingersoll, N. (1996). Psychological stress impairs spatial working memory: Relevance to electrophysiological studies of.. *Behavioral Neuroscience,* 110(4), 661.

Dubow, E. F., Edwards, S., & Ippolito, M. F. (1997). Life stressors, neighborhood

disadvantage, and resources: A focus on inner-city children's adjustment. *Journal of Clinical Child Psychology, 26*(2), 130-144. doi:10.1207/s15374424jccp2602_2.

Dumont, M., & Provost, M.A., (1999). Resilience in adolescence: Protective role of social support, coping strategies, self-esteem, and social activities on experience of stress and depression. *Journal of Youth and Adolescence, 28* (3):343-363.

DuMont, K. A., Widom, C., & Czaja, S. J. (2007). Predictors of resilience in abused and neglected children grown-up: The role of individual and neighborhood characteristics. *Child Abuse & Neglect, 31*(3), 255-274. doi:10.1016/j.chiabu.2005.11.015.

Egloff, B., & Hock, M. (2003). Assessing attention allocation toward threat-related stimuli: A comparison of the emotional Stroop task and the attentional probe task. *Personality and Individual Differences, 35*(2), 475-483. doi:10.1016/S0191-8869(02)00265-9.

Egner, T., Etkin, A., Gale, S., & Hirsch, J. (2008). Dissociable neural systems resolve conflict from emotional versus nonemotional distracters. *Cerebral Cortex, 18*(6), 1475-1484. doi:10.1093/cercor/bhm179.

Elsesser, K., Sartory, G., & Tackenberg, A. (2004). Attention, Heart Rate, and Startle Response during exposure to trauma-relevant pictures: A comparison of recent trauma victims and patients with posttraumatic stress disorder. *Journal of Abnormal Psychology, 113*(2), 289-301. doi:10.1037/0021-843X.113.2.289.

Fani, N. (2011). *Neural Correlates of Attention Bias in Posttraumatic Stress Disorder: A fMRI Study* (Doctoral dissertation). Retrieved from http://digitalarchive.gsu.edu/psych_diss/87/

Fani, N., Bradley-Davino, B., Ressler, K., & McClure-Tone, E. (2011). Attention Bias in

Adult Survivors of Childhood Maltreatment with and without Posttraumatic Stress Disorder. *Cognitive Therapy & Research, 35*(1), 57-67. doi:10.1007/s10608-010-9294-2.\

Fani, N., Jovanovic, T., Ely, T. D., Bradley, B., Gutman, D., Tone, E. B., & Ressler, K. J. (2012). Neural correlates of attention bias to threat in post-traumatic stress disorder. *Biological Psychology*, *90*(2), 134-142. doi:10.1016/j.biopsycho.2012.03.001.

Fani, N. N., Tone, E. B., Phifer, J. J., Norrholm, S. D., Bradley, B. B., Ressler, K. J., & ... Jovanovic, T. T. (2012). Attention bias toward threat is associated with exaggerated fear expression and impaired extinction in PTSD. *Psychological Medicine, 42*(3), 533-543. doi:10.1017/S0033291711001565.

Fanselow, M.S., (1982) The postshock activity burst, *Animal Learned Behavior, 10*, 448-454.

Feder, A., Nestler, E. J., & Charney, D. S. (2009). Psychobiology and molecular genetics of resilience. *Nature Reviews Neuroscience, 10*(6), 446-457. doi:10.1038/nrn2649.

Felner, R. D., Brand, S., DuBois, D. L., Adan, A., Mulhall, P. F., & Evans, E. G. (1995). Socioeconomic disadvantage, proximal environmental experiences, and socioemotional and academic adjustment in early adolescence: Investigation of a mediated effects model. *Child Development, 66*(3), 774-792. doi:10.2307/1131950.

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

Frewen, P.A., Dozois, D.J.A., Joanisse, M.F. & Neufeld, R.W.J. (2007). Selective Attention to Threat versus Reward: Meta-analysis and Neural-Network Modeling of the Dot-Probe Task, *Clinical Psychology Review* doi:10.1016/j.cpr.2007.05.006.

Gibb, B. E., Schofield, C. A.,& Coles, M. E. (2009). Reported history of childhood abuse and young adults' information-processing biases for facial displays of emotion. *Child Maltreat, 14*(2), 148–156.

Gilbertson, M. W., Shenton, M. E., Ciszewski, A., Kasai, K., Lasko, N. B., Orr, S. P., & Pitman, R. K. (2002). Smaller hippocampal volume predicts pathologic vulnerability to psychological trauma. *Nature Neuroscience, 5*(11), 1242-1247. doi:10.1038/nn958.

Gillespie, C.F, Bradley, B., Mercer, K., Smith, A.K., Connelly, K., Gapen, M., Weiss, T., Schwartz, A.C., Cubells, J.F., Ressler, K.J. (2009). Trauma exposure and stress-related disorders in inner city primary care patients. *General Hospital Psychiatry, 31,* 505–514.

Goldmann, E., Aiello, A., Uddin, M., Delva, J., Koenen, K., Gant, L. M., & Galea, S. (2011). Pervasive exposure to violence and posttraumatic stress disorder in a predominantly African American urban community: The Detroit neighborhood health study. *Journal of Traumatic Stress, 24*(6), 747-751. doi:10.1002/jts.20705.

Gray, J. (1988). The neuropsychological basis of anxiety. In C. Last and M. Hersen (Eds.), Handbook of Anxiety Disorders. New York: Pergammon Press.

Haglund, M. E. M., Nestadt, P. S., Cooper, N. S., Southwick, S. M., & Charney, D. S. (2007). Psychobiological mechanisms of resilience: Relevance to prevention and treatment of stress-related psychopathology. *Development & Psychopathology, 19*(3), 889-920.

Hart, H., & Rubia, K. (2012). Neuroimaging of child abuse: A critical review. *Frontiers in Human Neuroscience,6.* doi:10.3389/fnhum.2012.00052.

Houshyar, S., & Kaufman, J. (2005). Resiliency in maltreated children. In S. Goldstein,

& R. Brooks (Eds.), *Handbook of resilience in children* (pp. 181–200). New , NY: Kluwer Academic/Plenum Publishers.

Iwaniec, D., Larkin, E., & Higgins, S. (2006). Research Review: Risk and resilience in cases of emotional abuse. *Child & Family Social Work, 11*(1), 73-82. doi:10.1111/j.1365-2206.2006.00398.x

Kilpatrick, D. G., Saunders, B. E., Veronen, L. J., Best, C. L., & Von, J. M. (1987). Criminal victimization: Lifetime prevalence, reporting to police, and psychological impact. Crime and Delinquency, 33, 479-489.

Khoury, L., Tang, Y. L., Bradley, B., Cubells, J. F., & Ressler, K. J. (2010). Substance use, childhood traumatic experience, and posttraumatic stress disorder in an urban civilian population. *Depression and Anxiety, 27*(12), 1077-1086. doi:10.1002/da.20751.

Kwang, T., Wells, T. T., McGeary, J. E., Swann Jr., W. B., & Beevers, C. G. (2010). Association of the serotonin transporter promoter region polymorphism with biased attention for negative word stimuli. *Depression & Anxiety (1091-4269), 27*(8), 746-751. doi:10.1002/da.20708.

Lamoureux, B. E., Palmieri, P. A., Jackson, A. P., & Hobfoll, S. E. (2012). Child sexual abuse and adulthood-interpersonal outcomes: Examining pathways for intervention. *Psychological Trauma: Theory, Research, Practice, And Policy, 4*(6), 605-613. doi:10.1037/a0026079.

LeDoux, J. E. (2000). Emotion circuits in the brain. *Annual Review of Neuroscience*, 23155-184. doi:10.1146/annurev.neuro.23.1.155.

Luthar, S. S., Cicchetti, D., & Becker, B. (2000). The construct of resilience: A critical

evaluation and guidelines for future work. *Child Development, 71*(3), 543-562. doi:10.1111/1467-8624.00164.

MacLeod, C. M., & MacDonald, P. A. (2000). Interdimensional interference in the Stroop effect: Uncovering the cognitive and neural anatomy of attention. *Trends in Cognitive Science, 4*, 383–391.

MacLeod, C., Rutherford, E., Campbell, L., Ebsworthy, G., & Holker, L. (2002). Selective attention and emotional vulnerability: Assessing the causal basis of their association through the experimental manipulation of attentional bias. *Journal of Abnormal Psychology*, *111*(1), 107-123. doi:10.1037/0021-843X.111.1.107.

Maier, S. F., Amat, J., Baratta, M.V. Paul, E., & Watkins, L.R. (2006) Behavioral control, the medial prefrontal cortex, and resilience. *Dialogues in Clinical Neuroscience*, 8(4), 397-406.

Maren, S. (2001). Neurobiology of Pavlovian fear conditioning. *Annual Review Of Neuroscience, 24*(1), 897-931.

Masten, A. S. (2001). Ordinary magic: Resilience processes in development. *American Psychologist, 56*(3), 227-238. doi:10.1037/0003-066X.56.3.227.

McClure, F. H., Chavez, D. V., Agars, M. D., Peacock, M., & Matosian, A. (2008). Resilience in sexually abused women: Risk and protective factors. *Journal of Family Violence, 23(*2), 81-88. doi:10.1007/s10896-007-9129-4.

Meyerson, L. A., Long, P. L., Miranda, R. r., & Marx, B. P. (2002). The influence of childhood sexual abuse, physical abuse, family environment, and gender on the psychological adjustment of adolescents. *Child Abuse & Neglect, 26*(4), 387-405. doi:10.1016/S0145-2134(02)00315-0.

Mogg, K., & Bradley, B. P. (1999). Some methodological issues in assessing attentional biases for threatening faces in anxiety: A replication study using a modified version of the probe detection task. *Behaviour Research and Therapy,37*(6), 595-604. doi:10.1016/S0005-7967(98)00158-2.

Murphy, F. C., Nimmo-Smith, I., & Lawrence, A. D. (2003). Functional neuroanatomy of emotions: A metaanalysis. *Cognitive, Affective, & Behavioral Neuroscience, 3,* 207-233.

Pace, T. W., & Heim, C. M. (2011). A short review on the psychoneuroimmunology of posttraumatic stress disorder: From risk factors to medical comorbidities. *Brain, Behavior, and Immunity*, *25*(1), 6-13. doi:10.1016/j.bbi.2010.10.003.

Pérez-Edgar, K., Bar-Haim, Y., McDermott, J., Gorodetsky, E., Hodgkinson, C. A., Goldman, D., & ... Fox, N. A. (2010). Variations in the serotonin-transporter gene are associated with attention bias patterns to positive and negative emotion faces. *Biological Psychology, 83*(3), 269-271. doi:10.1016/j.biopsycho.2009.08.009.

Pine, D.S., Mogg, K., Bradley, B.P., Montgomery, L., Monk, C.S., McClure, E.B., et al., 2005. Attention bias to threat in maltreated children: implications for vulnerability to stress-related psychopathology. *American Journal of Psychiatry, 162*, 291–296.

Pitman, R.K. (1989). Post-traumatic stress disorder, hormones, and memory. *Biol Psychiatry, 26*: 221–223.

Polusny, M. A., & Follette, V. M. (1995). Long-term correlates of child sexual abuse: Theory andreview of the empirical literature. *Applied & Preventive Psychology, 4*(3), 143-166. doi:10.1016/S0962-1849(05)80055-1.

Porter, C., Lawson, J. S., & Bigler, E. D. (2005). Neurobehavioral Sequelae Of Child Sexual Abuse. *Child Neuropsychology, 11*(2), 203-220. doi:10.1080/092970490911379.

Rauch, S. L., Whalen, P.J., Shin, L.M., McInerney, S.C., Macklin, M.L., Lasko, N.B., Orr, S.P., & Pitman, R.K. (2000). Exaggerated amygdala response to masked facial stimuli in post-traumatic stress disorder: functional MRI study. *Biological Psychiatry, 47*, 769-776.

Reiss, S., Peterson, R. A., Gursky, D. M., & McNally, R. J. (1986). Anxiety sensitivity, anxiety frequency, and the prediction of fearfulness. *Behaviour Research and Therapy, 24*, 1–8.

Resnick, H. S., Kilpatrick, D. G., Dansky, B. S., Saunders, B. E., & Best, C. L. (1993). Prevalence of civilian trauma and posttraumatic stress disorder in a representative national sample of women. *Journal of Consulting And Clinical Psychology, 61*(6), 984-991. doi:10.1037/0022-006X.61.6.98.

Ritchie, K., Jaussen, I., Stewart, R., Dupuy, A., Courtet, P., Malafosse, A., & Ancelin, M. (2011). Adverse childhood environment and late-life cognitive functioning. *International Journal of Geriatric Psychiatry*, *26*(5), 503-510. doi:10.1002/gps.2553.

Rodriguez, N., Ryan, S. W., Vande Kemp, H., & Foy, D. W. (1997). Posttraumatic stress disorder in adult female survivors of child sexual abuse: A comparison study. *Journal of Consulting and Clinical Psychology*, *65*(1), 53-59. doi:10.1037/0022-006X.65.1.53.

Schumm, J. A., Hobfoll, S. E., & Keogh, N. (2004). Revictimization and Interpersonal Resource Loss Predicts PTSD Among Women in Substance-Use Treatment. *Journal Of Traumatic Stress, 17*(2), 173-181. doi:10.1023/B:JOTS.0000022624.53181.21.

Schumm, J. A., Stines, L. R., Hobfoll, S. E., & Jackson, A. P. (2005). The

Double-Barreled Burden of Child Abuse and Current Stressful Circumstances on Adult Women: The Kindling Effect of Early Traumatic Experience. *Journal of Traumatic Stress, 18*(5), 467-476. doi:10.1002/jts.20054.

Shi, C., & Davis, M. (1999). Pain pathways involved in fear conditioning measured with fear-potentiated startle: Lesion studies. *The Journal of Neuroscience, 19*(1), 420-430.

Shin, L. M., Whalen, P. J., Pitman, R. K., Bush, G., Macklin, M. L., Lasko, N. B., & ... Rauch, S. L. (2001). An fMRI study of anterior cingulate function in posttraumatic stress disorder. *Biological Psychiatry, 50*(12), 932-942. doi:10.1016/S0006-3223(01)01215-X.

Sotres-Bayon F., Bush, D.E., LeDoux, J.E. (2004). Emotional perseveration: an update on prefrontal-amygdala interactions in fear extinction, *11*(5):525-535.

Stein, M. B., Koverola, C. C., Hanna, C. C., & Torchia, M. G. (1997). Hippocampal volume in women victimized by childhood sexual abuse. *Psychological Medicine, 27*(4), 951-959. doi:10.1017/S0033291797005242.

Strange, B., Fletcher, P., Henson, R., Friston, K., Dolan, R. (1999). Segregating the functions of human hippocampus. *Proceedings of the National Academy of Sciences, 96:*4034-4039.

Thompson, E.R. (2007). Development and Validation of an Internationally Reliable Short-Form of the Positive and Negative Affect Schedule (PANAS). *Journal of Cross-Cultural Psychology, 38*, 2, 227-242.

University of Sydney, NSW Department of Juvenile Justice (DJJ) and Justice Health (JH). Overview of research and methods. Retrieved from http://ses.library.usyd.edu.au/bitstream/2123/2278/3/CH1-3.pdf

U.S. Department of Health and Human Services, Administration on Children, Youth and

Families. (2007). *Child maltreatment 2005*. Washington, DC: U.S. Government Printing Office, 2007.

Valentine, L., & Feinauer, L. L. (1993). Resilience factors associated with female survivors of childhood sexual abuse. *American Journal of Family Therapy, 21*(3), 216-224. doi:10.1080/01926189308250920.

Vuilleumier P. & Pourtois, G. (2007). Distributed and interactive brain mechanisms during emotion face perception: Evidence from functional neuroimaging. *Neuropsychologia, 45,* 174-194.

Wald, I., Shechner, T., Bitton, S., Holoshitz, Y., Charney, D.S., Muller, D., Fox, N.A., Pine, D.S., & Bar-Haim, Y. (2011). Attention bias away from threat during life threatening danger predicts PTSD symptoms at one-year follow-up, *Depression and Anxiety*, 28, 406–411.

Werner, E. (2000). Protective factors and individual resilience. In J. Shonkoff, & S. Meisels (Eds.), *Handbook of early childhood intervention* (2nd ed., pp.115–132). New York, NY: Cambridge University Press.

Westen, D., Lohr, N., Silk, K., Kerber, K., & Goodrich, S. (1990). Social Cognition and object relations scale (SCORS): TAT manual. Unpublished manuscript. University of Michigan.

Williams, J., & Nelson-Gardell, D. (2012). Predicting resilience in sexually abused adolescents. *Child Abuse & Neglect,36*(1), 53-63. doi:10.1016/j.chiabu.2011.07.004.

Wingo, A. P., Fani, N., Bradley, B., & Ressler, K. J. (2010). Psychological resilience and neurocognitive performance in a traumatized community sample. *Depression & Anxiety* (1091-4269), 27(8), 768-774. doi:10.1002/da.20675.

Yehuda, R. (2001). Are glucocortoids responsible for putative hippocampal damage in PTSD? How and when to decide.*Hippocampus, 11*(2), 85-89. doi:10.1002/hipo.1025.

Yehuda, R., Flory, J. D., Southwick, S., & Charney, D. S. (2006). Developing an Agenda for Translational Studies of Resilience and Vulnerability Following Trauma Exposure. *Annals of The New York Academy Of Sciences*, *1071*(1), 379-396. doi:10.1196/annals.1364.028.

Yehuda, R., Yang, R., Buchsbaum, M. S., & Golier, J. A. (2006). Alterations in cortisol negative feedback inhibition as examined using the ACTH response to cortisol administration in PTSD. *Psychoneuroendocrinology, 31*(4), 447-451. doi:10.1016/j.psyneuen.2005.10.007.

Yehuda, R., Golier, J. A., Tischler, L., Harvey, P. D., Newmark, R., Yang, R., & Buchsbaum, M. S. (2007). Hippocampal volume in aging combat veterans with and without post-traumatic stress disorder: Relation to risk and resilience factors. *Journal of Psychiatric Research, 41*(5), 435-445. doi:10.1016/j.jpsychires.2005.12.002.

Zald, D. H. (2003). The human amygdala and the emotional evaluation of sensory stimuli. *Brain Research: Brain Research Reviews, 41,* 88-123.

Table 1
Demographics

	N / Mean	% / (SD)
Age	40.24	(12.77)
Race		
African American	205	88.7%
Caucasian	13	5.6%
Other	4	1.7%
Current relationship status		
Single or never married	139	60.2%
Married	21	9.1%
Divorced	31	13.4%
Separated	13	5.6%
Widowed	16	6.9%
Education		
<12th	54	23.4%
12th	87	37.7%
GED	13	5.6%
Some college or tech school	57	24.7%
College or tech school graduate	16	6.9%
Graduate school	1	.4%
Household monthly income		
$0-249	60	26%
$250-499	29	12.6%
$500-999	64	27.7%
$1000-1999	50	21.6%
$2000 or more	19	8.2%
Substance abuse (drugs and alcohol)		
Yes (Current/Past)	9/71	3.9%/30.7%
No (Current/Past)	218/157	94.4%/68%
Arrest history		
None	37	16%
1-5	106	45.89%
6-10	15	6.49%
>10	13	5.63%

Table 2

Intercorrelations between behavioral measure components of proximal resilience

	2	3	4
1. Connor-Davidson Resilience Scale (CDRISC)	-.287**	.616**	.378**
2. Emotional Dysregulation Scale (EDS)		-.245**	-.331**
3. Positive Affect Negative Affect Scale (PANAS)			.304**
4. Self-Esteem (SCORS)			

N=133

* $p < .05$
** $p < .01$

Table 3

Intercorrelations between behavioral measure components of distal resilience

	2	3	4	5
1. Connor-Davidson Resilience Scale (CDRISC)	.280*	.249**	-.177*	-.225**
2. Total familial warmth/stability (CDF)		.935**	-.182**	-.207**
3. Maternal warmth/stability (CDF)			-.162*	-.212**
4. Global Assessment of Satisfaction (GAS)				.689**
5. Global Social Adjustment (GSA)				

N=133

** $p < .01$

*$p<.05$

Table 4

Proximal resilience, as compared to distal resilience, is not a better predictor of attention bias towards or away from threat stimuli. Neither the addition of proximal nor distal resilience accounted for a significant amount of total variance.

	N	Sig. *F* change.	*F*	R^2
Step 1:	133	.548	.769	.023
Total Trauma Exposure (TEI)				
Beck Depression Inventory (BDI)				
Childhood Trauma Questionnaire total (CTQ)				
Modified PTSD Symptom Scale total (MPSS)				
Step 2:	133	.612	.606	.037
Emotion Dysregulation Scale (EDS)ǂ				
Positive Affect Neg. Affect Scale (PANAS)ǂ				
Self Esteem ǂ				
Step 3:	133	.437	.951	.067
Total familial warmth/stability (CDF)¥				
Maternal warmth/stability (CDF)¥				
Global Assessment of Satisfaction (GAS)¥				
Global Social Adjustment (GSA)¥				
				N=133

a. Dependent variable = threat bias

ǂ proximal resilience

¥ distal resilience

Table 5

Proximal resilience, as compared to distal resilience, is not a better predictor of attention bias towards or away from happy stimuli. Neither the addition of proximal nor distal resilience accounted for a significant amount of total variance.

	N	Sig. *F* change	*F*	R^2
Step 1:	133	.767	.458	.014
Total Trauma Exposure (TEI)				
Beck Depression Inventory (BDI)				
CTQ total				
MPSS total				
Step 2:	133	.363	1.094	.048
EDS[ǂ]				
PANAS[ǂ]				
Self Esteem[ǂ]				
Step 3:	133	.071	2.403	.101
Total familial warmth/stability (CDF)[¥]				
Maternal warmth/stability (CDF)[¥]				
GAS[¥]				
GSA[¥]				

a. Dependent variable = happy bias

ǂ proximal resilience

¥ distal resilience

Figure 1. Dot probe task. All dot probe trials began with a neutral, central fixation cross that presented for 500 ms. Afterwards two photographs of human faces were displayed side by side for 500 ms. Each photograph was of the same actor, while one maintained an emotional expression and the other a neutral expression. The facial expression, when emotional, was either threatening or happy. After 500 ms the two faces cleared and a fixation cross appeared in place of one of the faces. Participants were then asked to indicate via button presses on which side of the screen (left or right) the cross appeared. Responses were timed, and participants were asked to answer as quickly as possible. During half the trials the cross replaced emotional (threatening or happy) stimuli, while the cross replaced neutral stimuli the other half of the trials. Actors were both Caucasian and African American, and all actors were female. The dot-probe task included 80 randomly ordered trials (32 positive/neutral human face pairs, 32 threat/neutral human face pairs, 16 neutral/neutral human face pairs). Adapted from "Neural correlates of attention bias to threat in post-traumatic stress disorder," by N. Fani, T. Jovanovic, T. Ely, B. Bradley, D. Gutman, E. Tone, and K. Ressler, 2012, *Biological Psychology, 90*(2), p. 134-142.

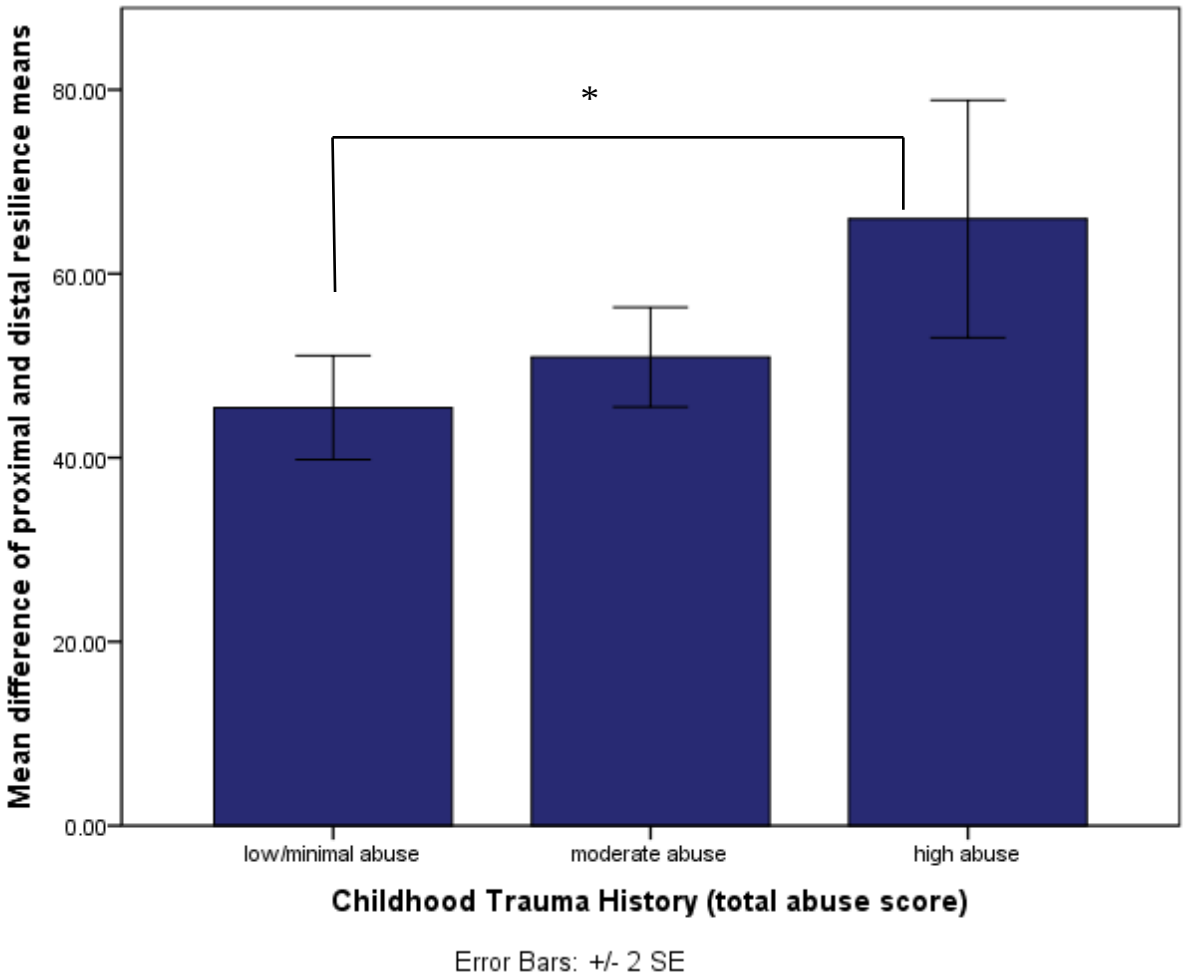

Figure 2. Bar graph showing the disparity between proximal and distal resilience as related to severity of childhood trauma history. The severity of childhood trauma history is measured as low/minimal, moderate, and high abuse from a self-report abuse measure. Mean difference scores for proximal and distal resilience were calculated for each category of abuse. Scores were calculated by taking the mean score for each proximal scale individually and then creating a composite mean proximal resilience score by averaging. A composite mean distal resilience score was calculated in the same manner, by calculating individual distal measure means and then averaging scores into one distal resilience score. Mean difference between proximal and distal resilience means was calculated by subtracting the composite distal resilience score from the composite proximal resilience score. An asterisk displays a significantly different proximal-to-distal ratio between high and low/minimal abuse participants, where participants with more severe childhood abuse have a larger proximal-to-distal ratio than participants who indicated low/minimal childhood abuse. No significance was determined between moderate childhood abuse and either high abuse or low/minimal abuse with respect to the proximal-to-distal ratio.

Appendix A

Beck Depression Inventory-II (BDI-II)

This questionnaire consists of 21 groups of statements. Please listen to each group of statements carefully, and then pick the one statement in each group that **best describes the way you have been feeling during the past TWO WEEKS, including today.** If several statements in the group seem to apply equally well, choose the highest number for that group.

1. Sadness

   0 I do not feel sad.

   1 I feel sad much of the time.

   2 I am sad all of the time.

   3 I am so sad or unhappy that I can't stand it.

2. Pessimism

   0 I am not discouraged about my future.

   1 I feel more discouraged about my future than I used to be.

   2 I do not expect things to work out for me.

   3 I feel my future is hopeless and will only get worse.

3. Past Failure

   0 I do not feel like a failure.

   1 I have failed more than I should have.

   2 As I look back, I see a lot of failure.

   3 I feel I am a total failure as a person.

4. Loss of Pleasure

   0 I get as much pleasure as I ever did from the things that I enjoy.

   1 I don't enjoy things as much as I used to.

   2 I get very little pleasure from the things I used to enjoy.

3 I can't get any pleasure from the things I used to enjoy.

5. Guilty Feelings

0 I don't feel particularly guilty.

1 I feel guilty over many things that I have done or should have done.

2 I feel quite guilty most of the time.

3 I feel guilty all of the time.

6. Punishment Feelings

0 I don't feel I am being punished.

1 I feel I may be punished.

2 I expect to be punished.

3 I feel I am being punished.

7. Self-Dislike

0 I feel the same about myself as ever.

1 I have lost confidence in myself.

2 I am disappointed (unhappy) with self.

3 I dislike myself.

8. Self-Criticalness

0 I don't criticize or blame myself more than usual.

1 I am more critical of (find more fault with) myself than I used to be.

2 I criticize (blame) myself for all my faults.

3 I blame myself for everything bad

that happens.

9. Suicidal Thoughts or Wishes

0 I don't have any thoughts of killing myself.

1 I have thoughts of killing myself, but I would not carry them out.

2 I would like to kill myself.

3 I would like to kill myself if I had the chance.

10 Crying

0 I don't cry anymore than I used to.

1 I cry more than I used to.

2 I cry over every little thing.

3 I feel like crying, but I can't.

11. Agitation

0 I am no more restless or wound up than usual.

1 I feel more restless or wound up than usual.

2 I am so restless or agitated it's hard to stay still.

3 I am so restless or agitated that I have to keep moving or doing something.

12. Loss of Interest

0 I have not lost interest in other people or activities.

1 I am less interested in other people or things than before.

2 I have lost most of my interest in other people or things.

3 It's hard to get interested in anything.

13. Indecisiveness

0 I make decisions about as well as ever.

1 I find it more difficult to make decisions than usual.

2 I have much greater difficulty in making decisions than I used to.

3 I have trouble making any decisions.

14. Worthlessness

0 I do not feel I am worthless (good-for-nothing).

1 I don't consider myself as worthwhile and useful as I used to.

2 I feel more worthless (good-for-nothing) as compared to other people.

3 I feel utterly worthless (totally good-for-nothing)

15. Loss of Energy

0 I have as much energy as ever.

1 I have less energy than I used to have.

2 I don't have enough energy to do very much.

3 I don't have enough energy to do anything.

16. Changes in Sleeping Patterns

0 I have not experienced any change in my sleeping pattern.

1 I sleep somewhat more/somewhat less than usual.

2 I sleep a lot more/a lot less than usual.

3 I sleep most of the day or I wake up 1-2 hours early and can't get back to sleep.

17. Irritability

0 I am no more irritable (cranky) than usual.

1 I am more irritable (cranky) than usual.

2 I am much more irritable (cranky) than usual.

3 I am irritable (cranky) all the time.

18. Changes in Appetite

0 I have not experienced any change in my appetite.

1 My appetite is somewhat less/somewhat greater than usual.

2 My appetite is much less/much greater than usual.

3 I have no appetite or I crave (want) food all the time.

19. Concentration Difficulty

0 I can concentrate (pay attention) as well as ever.

1 I can't concentrate (pay attention) as well as usual.

2 It's hard to keep my mind on anything for very long.

3 I find I can't concentrate (pay attention) on anything.

20. Tiredness or Fatigue

0 I am no more tired or fatigued than usual.

1 I get more tired or fatigued more

easily than usual.

2 I am too tired or fatigued to do a lot of the things I used to do.

3 I am too tired or fatigued to do most of the things I used to do.

21. Loss of Interest in Sex

0 I have not noticed any recent change in my interest in sex.

1 I am less interested in sex than I used to be.

2 I am much less interested in sex now.

3 I have lost interest in sex completely.

Appendix B

Modified PTSD Symptom Scale (MPSS)

The purpose of this scale is to measure the frequency and severity of symptoms in the past **TWO** weeks. Using the scale listed below, please indicate the frequency of symptoms to the left of each item.

FREQUENCY

0 Not at all per week **1** Once per week or less/ a little bit/once in awhile **2** Two to Four times per week/ somewhat/half the time **3** Five or more times very much/almost always

FREQUENCY

____1. Have you had recurrent or intrusive distressing thoughts or recollections about the event(s)?

____2. Have you been having recurrent bad dreams or nightmares about the event(s)?

____3. Have you had the experience of suddenly reliving the event(s), flashbacks of it, acting or feeling as it were re-occurring?

____4. Have you been intensely EMOTIONALLY upset when reminded of the event(s) (includes anniversary reactions)?

____5. Have you persistently been making efforts to avoid thoughts or feelings associated with the event(s) we've talked about?

____6. Have you persistently been making efforts to avoid activities, situations, or places that remind you of the event(s)?

____7. Are there any important aspects the event(s) that you still cannot recall?.

____8. Have you markedly lost interest in free time activities since the event(s)?

____9. Have you felt detached or cut off from others around you since the event(s)?

____10. Have you felt that your ability to experience emotions is less (e.g., unable to have loving feelings, do you feel numb, can't cry when sad, etc.)?

____11. Have you felt that any future plans or hopes have changed because of the event(s)? (e.g., no career, marriage, children, or long life?

____12. Have you been having persistent difficulty falling or staying asleep?

____13. Have you been continuously irritable or having outbursts of anger?

____14. Have you been having persistent difficulty concentrating?

____15. Are you overly alert (e.g., check to see who is around you, etc) since the event(s)?

____16. Have you been jumpier, more easily startled, since the event(s)?

____17. Have you been having intense PHYSICAL reactions (e.g., sweaty, heart palpitations) when reminded of the event(s)?

____18. How long have these symptoms bothered you?

Score **0**= < 1 month, **1**= 1-3 months, **2**= 3 months- 1 yr, **3**= > 1 yr

Appendix C

Childhood Trauma Questionnaire (CTQ)

Directions: These questions ask about some of your experiences growing up as a child and a teenager. For each question, circle the number that best describes how you feel. Although some of these questions are of a personal nature, please try to answer as honestly as you can. Your answers will be kept confidential.

WHEN I WAS GROWING UP	Never True	Rarely True	Sometimes True	Often True	Always True
1.I didn't have enough to eat	1	2	3	4	5
2. I knew there was someone there to take care of me and protect me	1	2	3	4	5
3. People in my family called me things like "stupid","lazy", or "ugly".	1	2	3	4	5
4. My parents were usually too drunk or too high to take care of me	1	2	3	4	5
5. There was someone in my family who helped me feel important or special	1	2	3	4	5
6. I had to wear dirty clothes	1	2	3	4	5
7. I felt loved.	1	2	3	4	5
8. I thought that my parents wished I had never been born	1	2	3	4	5
9. I got hit so hard by someone in my family that I had to see a doctor or go to the hospital.	1	2	3	4	5
10. There was nothing I wanted to change about my family	1	2	3	4	5
11. People in my family hit me so hard that it left me with bruises or marks.	1	2	3	4	5
12. I was punished with a belt, a board, a cord (or some other hard object).	1	2	3	4	5
13. People in my family looked out for each other.	1	2	3	4	5
14. People in my family said hurtful or insulting things to me.	1	2	3	4	5
15. I believe that I was physically abused.	1	2	3	4	5
16.I had the perfect childhood	1	2	3	4	5
17. I got hit or beaten so badly that it was noticed by Someone like a teacher, neighbor, or doctor.	1	2	3	4	5
18. Someone in my family hated me.	1	2	3	4	5
19. People in my family felt close to each other	1	2	3	4	5
20. Someone tried to touch me in a sexual way or tried to make me touch them.	1	2	3	4	5
21. Someone threatened to hurt me or tell lies about me unless I did something sexual with them.	1	2	3	4	5
22. I had the best family in the world.	1	2	3	4	5
23. Someone tried to make me do sexual things or watch sexual things.	1	2	3	4	5
24. Someone molested me (took advantage of me sexually).	1	2	3	4	5
25. I believe that I was emotionally abused.	1	2	3	4	5
26. There was someone to take me to the doctor if I needed it.	1	2	3	4	5
27. I believe that I was sexually abused.	1	2	3	4	5
28. My family was a source of strength and support.	1	2	3	4	5

Appendix D

Traumatic Events Inventory (TEI)

(To the patient) These questions are related to traumatic or stressful events that you might have experienced, witnessed, or been confronted with (i.e.- someone told you the event happened).

1. **Have you ever experienced a natural disaster (such as a tornado, hurricane, or flood)?**

   Experienced? (Yes / No)

   How many times? □1x □2x-3x □4x-5x □6x-8x □9x-10x □11x-15x □16x-19x □>20x

   How old were you the FIRST time it happened? _____

   When was the most RECENT time?

   ___NEVER happened to me ___ Within the LAST MONTH

   ___ Within the last 6 months ___ Within the last year

   ___ Within the last 5 years ___ More than 5 years ago

   Which of these is your WORST incident_____

2. **Have you ever experienced a serious accident or injury?**
   How many times? □1x □2x-3x □4x-5x □6x-8x □9x-10x □11x-15x □16x-19x □>20x

   Witnessed? (Yes / No)

   How many times? □1x □2x-3x □4x-5x □6x-8x □9x-10x □11x-15x □16x-19x □>20x

   How old were you the FIRST time it happened? _____

   When was the most RECENT time?

   ___NEVER happened to me ___ Within the LAST MONTH

   ___ Within the last 6 months ___ Within the last year

   ___ Within the last 5 years ___ More than 5 years ago

   Which of these is your WORST incident_____

3. **Have you ever experienced a sudden life-threatening illness?**
   Experienced? (Yes / No)

   How many times? □1x □2x-3x □4x-5x □6x-8x □9x-10x □11x-15x □16x-19x □>20x

   How old were you the FIRST time it happened? _____

   When was the most RECENT time?

   ___NEVER happened to me ___ Within the LAST MONTH

   ___ Within the last 6 months ___ Within the last year

   ___ Within the last 5 years ___ More than 5 years ago

   Which of these is your WORST incident_____

4. **Have you ever been in military combat or in military service in a war zone?**

Experienced? (Yes / No)

How many times? □1x □2x-3x □4x-5x □6x-8x □9x-10x □11x-15x □16x-19x □>20x

How old were you the FIRST time it happened? _____

When was the most RECENT time?

___NEVER happened to me ___ Within the LAST MONTH

___ Within the last 6 months ___ Within the last year

___ Within the last 5 years ___ More than 5 years ago

Which of these is your WORST incident_____

5. **Have you had a close friend or family member who was murdered?**

Witnessed? (Yes / No)

How many times? □1x □2x-3x □4x-5x □6x-8x □9x-10x □11x-15x □16x-19x □>20x

Confronted with? (Yes / No)

How many times? □1x □2x-3x □4x-5x □6x-8x □9x-10x □11x-15x □16x-19x □>20x

How old were you the FIRST time it happened? _____

When was the most RECENT time?

___NEVER happened to me ___ Within the LAST MONTH

___ Within the last 6 months ___ Within the last year

___ Within the last 5 years ___ More than 5 years ago

Which of these is your WORST incident_____

7a . Have you been attacked with a gun, knife, or other weapon by a spouse, romantic partner/boyfriend or girlfriend ?

Experienced? (Yes / No)

How many times? □1x □2x-3x □4x-5x □6x-8x □9x-10x □11x-15x □16x-19x □>20x

How old were you the FIRST time it happened? _____

When was the most RECENT time?

___NEVER happened to me ___ Within the LAST MONTH

___ Within the last 6 months ___ Within the last year

___ Within the last 5 years ___ More than 5 years ago

Which of these is your WORST incident_____

7. Have you been attacked with a gun, knife, or other weapon by someone *other* than a spouse, romantic partner/boyfriend or girlfriend?

Experienced? (Yes / No)

How many times? □1x □2x-3x □4x-5x □6x-8x □9x-10x □11x-15x □16x-19x □>20x

How old were you the FIRST time it happened? _____

When was the most RECENT time?

___NEVER happened to me ___ Within the LAST MONTH

___ Within the last 6 months ___ Within the last year

___ Within the last 5 years ___ More than 5 years ago

Which of these is your WORST incident_____

7c. Have you witnessed a family member or friend being attacked with a gun, knife, or other weapon?

Witnessed? (Yes / No)

How many times? □1x □2x-3x □4x-5x □6x-8x □9x-10x □11x-15x □16x-19x □>20x

How old were you the FIRST time it happened? _____

When was the most RECENT time?

___NEVER happened to me ___ Within the LAST MONTH

___ Within the last 6 months ___ Within the last year

___ Within the last 5 years ___ More than 5 years ago

Which of these is your WORST incident_____

7d. Have you witnessed someone *other* than a family member or friend being attacked with a gun, knife, or other weapon?

Witnessed? (Yes / No)

How many times? □1x □2x-3x □4x-5x □6x-8x □9x-10x □11x-15x □16x-19x □>20x

How old were you the FIRST time it happened? _____

When was the most RECENT time?

___NEVER happened to me ___ Within the LAST MONTH

___ Within the last 6 months ___ Within the last year

___ Within the last 5 years ___ More than 5 years ago

Which of these is your WORST incident_____

8a. Have you been attacked without a weapon by a spouse, romantic partner/boyfriend or girlfriend?

Experienced? (Yes / No)

How many times? □1x □2x-3x □4x-5x □6x-8x □9x-10x □11x-15x □16x-19x □>20x

How old were you the FIRST time it happened? _____

When was the most RECENT time?

___NEVER happened to me ___ Within the LAST MONTH

___ Within the last 6 months ___ Within the last year

___ Within the last 5 years ___ More than 5 years ago

Which of these is your WORST incident_____

8. Have you been attacked without a weapon by someone *other* than a spouse, romantic partner/boyfriend or girlfriend?

Experienced? (Yes / No)

How many times? □1x □2x-3x □4x-5x □6x-8x □9x-10x □11x-15x □16x-19x □>20x

How old were you the FIRST time it happened? _____

When was the most RECENT time?

___NEVER happened to me ___ Within the LAST MONTH

___ Within the last 6 months ___ Within the last year

___ Within the last 5 years ___ More than 5 years ago

Which of these is your WORST incident_____

8c. Have you witnessed a family member or friend being attacked without a weapon?

Witnessed? (Yes / No)

How many times? □1x □2x-3x □4x-5x □6x-8x □9x-10x □11x-15x □16x-19x □>20x

How old were you the FIRST time it happened? _____

When was the most RECENT time?

___NEVER happened to me ___ Within the LAST MONTH

___ Within the last 6 months ___ Within the last year

___ Within the last 5 years ___ More than 5 years ago

Which of these is your WORST incident_____

8d. Have you witnessed someone *other* than a family member or friend being attacked without a weapon?

Witnessed? (Yes / No)

How many times? □1x □2x-3x □4x-5x □6x-8x □9x-10x □11x-15x □16x-19x □>20x

How old were you the FIRST time it happened? _____

When was the most RECENT time?

___NEVER happened to me ___ Within the LAST MONTH

___ Within the last 6 months ___ Within the last year

___ Within the last 5 years ___ More than 5 years ago

Which of these is your WORST incident_____

9. Did you witness violence between your parents or caregivers when you were a child? (0-18y/o)

Witnessed? (Yes / No)

How many times? □1x □2x-3x □4x-5x □6x-8x □9x-10x □11x-15x □16x-19x □>20x

How old were you the FIRST time it happened? _____

How old were you the LAST time it happened? _____

Which of these is your WORST incident_____

10. Were you beaten or physically punished in other ways as a child (do not include spanking that interviewee considers appropriate unless it resulted in serious injury or medical attention)

Experienced? (Yes / No)

How many times? □1x □2x-3x □4x-5x □6x-8x □9x-10x □11x-15x □16x-19x □>20x

How old were you the FIRST time it happened? _____

How old were you the LAST time it happened? _____

Over how many years did it happen (choose longest period)?

_____ Less than 1 _____ 1-2 _____3-4 _____More than 4

Who did this (circle all that apply):

Father (or primary male caregiver) Yes No

Mother (or primary female caregiver) Yes No

Stepparent or partner/boyfriend/girlfriend of parent Yes No

Other adult family member Yes No

Other adult known to you (neighbor, babysitter) Yes No

Adult/Stranger Yes No

Older Sibling Yes No

Other Yes No

Which of these is your WORST incident_____

10b. Between the ages of 0 and 18, did adults who cared for you talk to you in mean ways (for example, humiliate you, put you down, tell you were not wanted by them or that you were no good)?

Experienced? (Yes / No)
How many times? □1x □2x-3x □4x-5x □6x-8x □9x-10x □11x-15x □16x-19x □>20x
How old were you the FIRST time it happened? _____
How old were you the LAST time it happened? _____
Over how many years did it happen (choose longest period)?
_____ Less than 1 _____ 1-2 _____3-4 _____More than 4

Who did this (check all that apply):

Father (or primary male caregiver) Yes No
Mother (or primary female caregiver) Yes No
Stepparent or partner/boyfriend/girlfriend of parent Yes No
Other adult family member Yes No
Other adult known to you (neighbor, babysitter) Yes No
Adult/Stranger Yes No
Older Sibling Yes No
Other Yes No

Which of these is your WORST incident_____

11. Between the ages of 0 and 13 did an adult or older teenager sexually abuse you or have any type of sexual contact with you?

Experienced? (Yes / No)
How many times? □1x □2x-3x □4x-5x □6x-8x □9x-10x □11x-15x □16x-19x □>20x
How old were you the FIRST time it happened? _____
How old were you the LAST time it happened? _____
Over how many years did it happen (choose longest period)?
_____ Less than 1 _____ 1-2 _____3-4 _____More than 4

Who did this (check all that apply):

Father (or primary male caregiver) Yes No
Mother (or primary female caregiver) Yes No
Stepparent or partner/boyfriend/girlfriend of parent Yes No
Other adult family member Yes No
Other adult known to you (neighbor, babysitter) Yes No
Adult/Stranger Yes No
Older Sibling Yes No
Other Yes No

Which of these is your WORST incident_____

12. Between the ages of 14 and 17 did an adult or older teenager sexually abuse you or have any type of sexual contact with you? (Do not include consensual sexual contact between adolescents or between older adolescents and young adults. <u>The key issue here is consent</u>).

Experienced? (Yes / No)

How many times? □1x □2x-3x □4x-5x □6x-8x □9x-10x □11x-15x □16x-19x □>20x

How old were you the FIRST time it happened? _____

How old were you the LAST time it happened? _____

Over how many years did it happen (choose longest period)?

_____ Less than 1 _____ 1-2 _____3-4 _____More than 4

Who did this (check all that apply):

Father (or primary male caregiver) Yes No

Mother (or primary female caregiver) Yes No

Stepparent or partner/boyfriend/girlfriend of parent Yes No

Other adult family member Yes No

Other adult known to you (neighbor, babysitter) Yes No

Adult/Stranger Yes No

Older Sibling Yes No

Other Yes No

Which of these is your WORST incident_____

13. After the age of 17 did someone rape you or sexually assault you (by that I mean did someone use physical force or threats of physical force to make you have some unwanted sexual contact with them)?

Experienced? (Yes / No)

How many times? □1x □2x-3x □4x-5x □6x-8x □9x-10x □11x-15x □16x-19x □>20x

How old were you the FIRST time it happened? _____

When was the most RECENT time?

___NEVER happened to me ___ Within the LAST MONTH

___ Within the last 6 months ___ Within the last year

___ Within the last 5 years ___ More than 5 years ago

Which of these is your WORST incident_____

14. Are there any other experiences that have been traumatic or very stressful for you that we have not covered yet? (Yes / No)

How many times? □1x □2x-3x □4x-5x □6x-8x □9x-10x □11x-15x □16x-19x □>20x

Witnessed? (Yes/No)

How many times? □1x □2x-3x □4x-5x □6x-8x □9x-10x □11x-15x □16x-19x □>20x

Confronted With? (Yes / No)

How many times? □1x □2x-3x □4x-5x □6x-8x □9x-10x □11x-15x □16x-19x □>20x

At what age did it FIRST occur?_____

When was the most RECENT time?

___NEVER happened to me ___ Within the LAST MONTH

___ Within the last 6 months ___ Within the last year

___ Within the last 5 years ___ More than 5 years ago

Which of these is your WORST incident_____

15. Would you describe the home that you grew up in as **stable** or **unstable**?

PSS What: What would you say is your worst trauma?

_____

_____

PSS When: **How old were you when this happened? _____**

IMPORTANT: The worst trauma questions are meant to assess the participant's worst "PTSD-like trauma" (defined as: experiencing, witnessing, or being confronted with violence or the threat of violence which resembles a criterion A trauma). If a participant endorses a non-criterion A trauma, ask if this trauma was, without a doubt, more traumatic than the worst trauma they experienced, witnessed or were confronted with. While a PTSD- like trauma may have occurred repeatedly (eg. Repeated sexual assaults by family member), "tough periods of time" such as divorces or bereavement are not considered traumatic events for these questions. Politely ask the participant to choose an alternate event.

Appendix E

Connor-Davidson Resilience Scale (CD-RISC)

Please indicate how much you agree with the following statements as they apply to you over the LAST MONTH. If a particular situation has not occurred recently, answer according to how you think you would have felt.

	Not True at All (0)	Rarely True (1)	Sometimes True (2)	Often True (3)	True nearly all the time (4)
1. I am able to adapt when changes occur					
3 .When there are no clear solutions to my problems, sometimes fate or God can help					
4. I can deal with whatever comes my way.					
6. I try to see the humorous side of things when I am faced with problems.					
7. Coping with stress can make me stronger					
8. I tend to bounce back after illness, injury, or other hardships.					
9. Good or bad, I believe that most things happen for a reason					
11. I believe I can achieve my goals, even if there are obstacles.					
14. Under pressure, I stay focused and think clearly					
16. I am not easily discouraged by failure					
17. I think of myself as a strong person when dealing with life's challenges and difficulties.					
19. I am able to handle unpleasant or painful feelings like sadness, fear and anger.					

Appendix F

Emotional Dysregulation Scale (EDS)

Please rate the extent to which the following items describe you, where ***1=not true at all, 4=somewhat true,*** and ***7=very true.***

	Not true						**Very true**
2. It's often hard for me to calm down when I'm upset	**1**	**2**	**3**	**4**	**5**	**6**	**7**
4. When I am upset, I have trouble knowing exactly what I am feeling, I just feel bad	**1**	**2**	**3**	**4**	**5**	**6**	**7**
5. When I am feeling bad, I have trouble remembering anything positive, everything just	**1**	**2**	**3**	**4**	**5**	**6**	**7**
7. Emotions overwhelm me	**1**	**2**	**3**	**4**	**5**	**6**	**7**
8. When I'm upset, I feel all alone in the world	**1**	**2**	**3**	**4**	**5**	**6**	**7**
10. When I'm upset, I have trouble solving problems	**1**	**2**	**3**	**4**	**5**	**6**	**7**
11. When I'm upset, I have trouble remembering that people care about me	**1**	**2**	**3**	**4**	**5**	**6**	**7**
12. When I'm upset, everything feels like a disaster or crisis	**1**	**2**	**3**	**4**	**5**	**6**	**7**
14. When I am upset, I have trouble seeing or remembering anything good about myself	**1**	**2**	**3**	**4**	**5**	**6**	**7**
16. I have trouble soothing myself when I am upset	**1**	**2**	**3**	**4**	**5**	**6**	**7**
19. When my emotions are stirred up, I have trouble thinking clearly	**1**	**2**	**3**	**4**	**5**	**6**	**7**
21. When my emotions are strong, I often make bad decisions	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Appendix G

SOCIAL COGNITION AND OBJECT RELATIONS SCALE - GLOBAL RATING METHOD

Complexity of representation of people: 1 = is egocentric, or sometimes confuses thoughts, feelings, or attributes of the self and others; 3 = tends to describe people's personalities and internal states in minimally elaborated, relatively simplistic ways, or splits representations into good and bad; 5 = representations of the self and others are stereotypical or conventional, is able to integrate both good and bad characteristics of self and others, has awareness of impact on others; 7 = is psychologically minded, insight into self and others, differentiated and shows considerable complexity

1 2 3 4 5 6 7

Affective quality of representations: (i.e., what the person expects from relationships, and how s/he tends to experience significant others and describe significant relationships): 1 = malevolent, abusive, caustic; 3 = largely negative or unpleasant, but not abusive; 5 = mixed, neither primarily positive nor primarily negative, (needs to have some positive to be scored 5); 7 = generally positive expectations of relationships (but not pollyannaish), a favorable and affirmative view of relationships **Note: where affective quality is absent, bland, or limited, code 4**

1 2 3 4 5 6 7

Emotional investment in relationships: 1 = tends to focus primarily on his/her own needs in relationships, has tumultuous relationships, or has few if any relationships; 3 = somewhat shallow relationships, or only **alludes to others**; 5 = demonstrates conventional sentiments of friendship, caring, love, and empathy; 7 = tends to have deep, committed relationships with mutual sharing, emotional intimacy, interdependence, and respect, positive connectedness and appreciation of others **Note: where only one character is described and no relationship is depicted, code 2**

1 2 3 4 5 6 7

Emotional investment in values and moral standards: 1 = behaves in selfish, inconsiderate, self-indulgent or aggressive ways without any sense of remorse or guilt; 3 = shows signs of *some* internalization of standards (e.g., avoids doing "bad" things because knows will be punished for them, thinks in relatively childlike ways about right and wrong, etc.), or is morally harsh and rigid toward self or others; 5 = is invested in moral values and tries to live up to them; 7 = thinks about moral questions in a way that combines abstract thought, a willingness to challenge or question convention, and genuine compassion and thoughtfulness in actions (i.e., not just intellectualized) **Note: where no moral concerns are raised in a particular story, code 4**

1 2 3 4 5 6 7

Understanding of social causality: 1 = narrative accounts of interpersonal experiences are confused, distorted, extremely sparse, or difficult to follow, limited awareness and coherence; 3 = understands people in relatively simple, but sensible ways, or describes interpersonal events in ways that largely make sense but may have a few gaps or incongruities; 5 = tends to provide straightforward narrative accounts of interpersonal events in which people's actions result from the way they experience or interpret situations; 7 = tends to provide particularly coherent narrative accounts of interpersonal events, and to understand people very well, understands the impact of their behavior on others and others behavior on them. **Note: where subject describes interpersonal events as if they just happen, with little sense of why people behave the way they do (i.e., alogical rather than illogical stories that seem to lack any causal understanding), code 2**

1 2 3 4 5 6 7

Experience and management of aggressive impulses: 1 = physically assaultive, destructive, sadistic, or in poor control of aggression, impulsive; 3 = angry, passive-aggressive, denigrating, or physically abusive to self (or fails to protect self from abuse); 5 = avoids dealing with anger by denying it, defending against it, or avoiding confrontations; 7 = can express anger and aggression and assert self appropriately **Note: if no anger content in the story, code 4**

1 2 3 4 5 6 7

Self-esteem: 1 = views self as loathsome, evil, rotten, contaminating, or globally bad; 3 = has low self-esteem (e.g., feels inadequate, inferior, self-critical, etc.) or is unrealistically grandiose; 5 = displays a range of positive and negative feelings toward the self; 7 = tends to have realistically positive feelings about him/herself **Note: needs to have some positive to be scored a 5 or above**

1 2 3 4 5 6 7

Identity and coherence of self: 1 = fragmented sense of self, has multiple personalities; 3 = views of , or feelings about, the self-fluctuate widely and unpredictably; unstable sense of self; 5 = identity and self-definition are not a major concern or preoccupation; 7 = feels like an integrated person with long-term ambitions and goals **Note: ambiguity about a goal is still considered a goal and may be scored in the higher range**

1 2 3 4 5 6 7

Appendix H

PANAS-T

This scale consists of a number of words and phrases that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you have felt this way *in general, that is, on the average.*

1 2 3 4 5
very slightly or not at all a little moderately quite a bit extremely

1)	**interested**	**1**	**2**	**3**	**4**	**5**	**13)**	**ashamed**	**1**	**2**	**3**	**4**	**5**
2)	**distressed**	**1**	**2**	**3**	**4**	**5**	**14)**	**inspired**	**1**	**2**	**3**	**4**	**5**
3)	**excited**	**1**	**2**	**3**	**4**	**5**	**15)**	**nervous**	**1**	**2**	**3**	**4**	**5**
4)	**upset**	**1**	**2**	**3**	**4**	**5**	**16)**	**determined**	**1**	**2**	**3**	**4**	**5**
5)	**strong**	**1**	**2**	**3**	**4**	**5**	**17)**	**attentive**	**1**	**2**	**3**	**4**	**5**
6)	**guilty**	**1**	**2**	**3**	**4**	**5**	**18)**	**jittery**	**1**	**2**	**3**	**4**	**5**
7)	**scared**	**1**	**2**	**3**	**4**	**5**	**19)**	**active**	**1**	**2**	**3**	**4**	**5**
8)	**hostile**	**1**	**2**	**3**	**4**	**5**	**20)**	**afraid**	**1**	**2**	**3**	**4**	**5**
9)	**enthusiastic**	**1**	**2**	**3**	**4**	**5**	**21)**	**self conscious**	**1**	**2**	**3**	**4**	**5**
10)	**proud**	**1**	**2**	**3**	**4**	**5**	**22)**	**stupid**	**1**	**2**	**3**	**4**	**5**
11)	**irritable**	**1**	**2**	**3**	**4**	**5**	**23)**	**deserving of criticism**	**1**	**2**	**3**	**4**	**5**
12)	**alert**	**1**	**2**	**3**	**4**	**5**	**24)**	**embarrassed**	**1**	**2**	**3**	**4**	**5**
							25)	**regretful**	**1**	**2**	**3**	**4**	**5**

Appendix I

Clinical Data Form (CDF)

Please tell us about when you were growing up. (Note: If your circumstances changed dramatically at some point in childhood, answer for whatever period seems best to describe what you went through as a child. If you had more than one mother or father figure, describe the person you most consider your mother or father.)

Who raised you?

☐ both biological parents ☐ biological mother (with/without step-father) ☐ biological father (with/without step-mother) ☐ adoptive parents ☐ foster parents ☐ other _____

How was your relationship with your mother as a child? ~~1~~ ~~2~~ ~~3~~ ~~4~~ ~~5~~

poor/difficult *positive/loving*

How was your relationship with your father as a child? ~~1~~ ~~2~~ ~~3~~ ~~4~~ ~~5~~

poor/difficult *positive/loving*

How stable was your family environment when you were growing up?

~~1~~ ~~2~~ ~~3~~ ~~4~~ ~~5~~

very unstable *very stable*

How warm and nurturing was your family when you were growing up?

~~1~~ ~~2~~ ~~3~~ ~~4~~ ~~5~~

cold/unpleasant *warm/nurturing*

When you were growing up did one of your parents or other people who raised you drink too much? ☐ No ☐ Yes

When you were growing up did one of your parents or other people who raised you use drugs?

☐ No ☐ Yes

How often did a parent or other adult in the household make you feel that you were loved, supported, and cared for?

Not at All				**Most of the time**
1	2	3	4	5

How often did a parent or other adult in the household express physical affection for you, such as hugging or other physical gesture of warmth and affection?

Not at All				**Most of the time**
1	2	3	4	5

Would you say that the household you grew up in was well-organized and well-managed?

Not at All				Most of the time
1	2	3	4	5

Did your family know what you were up to?

Not at All				Most of the time
1	2	3	4	5

How much did a parent or other adult in the household understand your problems and worries?

Not at All				Most of the time
1	2	3	4	5

Was there a parent or adult in your household that you could confide in about things that were bothering you?

Not at All				Most of the time
1	2	3	4	5

How much did a parent or adult who raised you give you time and attention when you needed it?

Not at All				Most of the time
1	2	3	4	5

How much effort did a parent or other adult living in the household put into watching over you and making sure you had a good upbringing?

Not at All				A lot of effort
1	2	3	4	5

Were you ever separated from your mother or other primary parental caregiver for extended period of time?

No	Yes

Did you mother or other adult who raised you die when you were a child?

No	Yes

Were you ever placed in foster care?

No	Yes

Were you ever placed in a juvenile corrections residential facility?

No	Yes

Was anyone in your household depressed or mentally ill?

No	Yes

Did anyone in your household go to prison?

No	Yes

Did anyone in your household ever commit a serious crime?

No	Yes

Appendix J

SID:_____
Initials:_____
Date:_____

Collaborative Longitudinal Study of Personality

Longitudinal Interval Follow-up Evaluation – BASE
(LIFE-BASE)

CURRENT VERSION ONLY

PSYCHOSOCIAL FUNCTIONING

Structure of the Psychosocial Portion of the Interview:

Participants will be asked about their functioning for the past month. The monthly rate is *made by asking about the best and worst weeks of functioning during the last month, and determining the "usual" or "typical" level of functioning*. Brief periods, e.g., 3 - 4 days, of not functioning well in the context of an otherwise good month should not be used in the "If the subject reports variable functioning, ask about their best and worst functioning and rate their 'usual' function as an average of the participant's best and worst functioning."

Orientation and Overview:

- During the interview, the interviewer should use probes such as:
- What is a usual day for you like?
- How do you spend your evenings and weekends?
- What do you do with your free time?
- Tell me about your friends?
- What about your family?
- How satisfied are you with your current situation?
- How do you get along with people at work?
- At home? At school?

A. 1. WORK

Which of the following categories best describes the participant's usual employment status over the past month?

1 = Full-time gainful employment
2 = Part-time gainful employment (30 hours or less/ week)
3 = Unemployed but expected to work by self or others
4 = Unemployed but not expected to work by self or others (e.g., physically disabled)
5 = Retired
6 = Homemaker
7 = Student (includes part-time)
8 = Leave of absence due to medical reasons (e.g., holding job; plans to return)
9 = Volunteer work—full-time
10 = Volunteer work—part-time
11 = Other (specify)_____

A. 2. EMPLOYMENT or SELF-EMPLOYMENT (Exclude housework in one's own home)

How many hours per week during the past week did the participant spend in employment or self-employment activities other than housework in her/his own home? (Include work in a regularly scheduled structured volunteer program, but do not include work done in a work-therapy program.) _____

Using the following categories, indicate those that best characterize the "typical level" of functioning in work activities during… (This rating should be made in terms of both quantity and quality of work carried out.)

0 = Not applicable. Did not work for reasons other than psychopathology.
1 = No impairment – high level (i.e., worked as much as someone in his/her social situation would be expected to work, and worked at a high level.)
2 = No impairment – satisfactory level (i.e., has worked as much as someone in his/ her social situation would be expected to work, and worked at a satisfactory level.)
3 = Mild impairment (i.e., worked somewhat less than someone in his/her social situation would be expected to work and/or had mild difficulties in carrying out work activities.)
4 = Moderate impairment (has missed a lot of work and/or has had considerable difficulties in carrying out work activities.)
5 = Severe impairment (has missed a great deal of work when someone in his/her social situation would have been expected to work and/or has been virtually unable to carry out his/her work activities when he/she did work.)
6 = No information

A. 3. HOUSEHOLD DUTIES (Include housecleaning, cooking, shopping, gardening, carpentry, plumbing, chauffeuring children)

NOTE: This section should be rated for both men and women.

Which of the following categories best characterizes the degree of impairment the participant has demonstrated in household activities during the past month?

0 = Not applicable.
1 = No impairment – high level (e.g., has carried out housework most of the time that would be expected, and worked at a high level).
2 = No impairment – satisfactory level (e.g., has carried out housework most of the time that would be expected, and worked at a satisfactory level).
3 = Mild impairment – (e.g., worked somewhat less than expected and/or had mild difficulties in carrying out housework).
4 = Moderate impairment (has missed a lot of housework when expected, and/or has had considerable difficulties in carrying out housework).
5 = Severe impairment (has missed a great deal of housework when expected, and/or has been virtually unable to carry out housework when he/she attempts it).

A. 4. STUDENT WORK

Definition of student: Enrolled in a course of study being carried out under the auspices of a recognized education institution (e.g., university, high school, technical or trade school, extension courses.) Do not include activities which are better classified as hobbies (e.g., night course is bridge or macrame.)

Which of the following categories best characterizes the "typical level" of functioning in student work during the last month?

0 = Not applicable because not enrolled in a student program for reasons other than psychopathology.
1 = No impairment – high level (e.g., worked as would be expected if not symptomatic and got high grades).
2 = No impairment – satisfactory level (e.g., has worked as much as expected and got satisfactory grades).
3 = Mild impairment (e.g., worked somewhat less and/or got grades somewhat below expected if not symptomatic).
4 = Moderate impairment (missed a lot of school work and/or got grades consistently below expected).
5 = Severe impairment (missed most of school work and/or dropped out of school or gat grades far below those expected).
6 = No information.

B. INTERPERSONAL RELATIONSHIPS

Interpersonal relations will be rated in two separate areas—family and friends. Rate the "usual" or "typical" level of functioning in the past month.

1. Interpersonal Relationships with Family

- If the participant has had variable levels of relationships with different children or other important relatives, use the rating of 6 or 7.
- Significant relative: Any relative with whom there has been significant contact.
- In order for a participant to be rated as having a mate/partner/spouse, they must either be married or with said person for at least one year.
- Couples who are separated or divorces will be rated as "0."

Which of the following best characterizes the participant's level of interpersonal relationships with his/her family during the past month?

a. Parents……_____ d. Children……...._____
b. Siblings……_____ e. Other Important Relatives....._____
c. Spouse/ Mate……...._____

0 = Not applicable because does not have relatives in this category.
1 = Very good, e.g., experiences very good relationships with this (these) family member(s), with only transient friction which is rapidly resolved. Feels only very minor or occasional need to improve quality of relationship which is usually close and satisfying.
2 = Good, e.g., argues occasionally, but arguments usually resolved satisfactorily within a short time. May occasionally prefer not to be with them because of dissatisfaction with them or be actively working with them to improve relationships.
3 = Fair, e.g., often argues with this (these) family member(s) and takes a long time to resolve arguments. May withdraw from this person (these people) due to dissatisfaction. Often thinks that relationship needs to be either more harmonious or closer emotionally even when no conflict is present. For those relatives not living with the participant, contacts with them by choice are less frequent than feasible or rarely enjoyed very much when made.
4 = Poor, e.g., regularly argues with this (these) family member(s) and such arguments are rarely ever resolved satisfactorily. Regularly prefers to avoid contact with them and/or feels great deficit in emotional closeness. For those family members out of the household, participant avoids seeing as much as possible and derives no pleasure from contact when made.
5 = Very poor, e.g., either constantly argues with this (these) family member(s) or withdraws from them most of the time
6 = Variable, different levels for various members of this group, and would not warrant rating of good or better (2, 1) with more than 1 member of this group.
7 = Variable, different levels for various members of this group, and would not warrant rating or good or better (2, 1) with any member of this group.
8 = No information.

2. Interpersonal Relationships with Friends

   Which of the following categories best characterizes the participant's interpersonal relationships with friends during the last month?

   1 = Very good, e.g., had several special friends that he/she saw regularly and frequently and was close to.
   2 = Good, e.g., had at least two special friends that he/she saw from time to time and was fairly close to.
   3 = Fair, e.g., had only one special friend that he/she saw from time to time and was fairly close to, or contacts limited to one or two friends that he/she was close to.
   4 = Poor, e.g., had no special friends he/she saw from time to time and was fairly close to, or contacts limited to one or two friends that he/she was close to.
   5 = Very poor, e.g., had no special friends and practically no social contact.
   6 = No information.

C. SEXUAL FUNCTIONING

1. Marital Status

   a. Current Marital Status (circle one)
      0 = No information
      1 = Single (never married nor presently living with someone for more than 1 year)
      2 = Married (including common law)
      3 = Presently living with someone of the opposite sex for at least 1 year
      4 = Widowed
      5 = Separated (if legally married, or apart from common law spouse with no chance of returning)
      6 = Divorced (or left common law spouse "for good")
      7 = Presently living with someone of the same sex for at least 1 year

   b. Did any of the following changes in marital status occur in the last month?
      1 = No 2 =Yes 3 = No information

      _____Married
      _____Separated
      _____Divorced
      _____Widowed

2. Primary Sexual Orientation (circle one)

   0 = No information – not sure
   1 = Heterosexual
   2 = Homosexual
   3 = Bisexual

3. Sexual Satisfaction

   How satisfied have you been with your sexual activities with another person in the month?

   1 = Not having sexual activities, satisfied
   2 = Not having sexual activities, not satisfied
   3 = Having sexual activities, good
   4 = Having sexual activities, fair
   5 = Having sexual activities, poor
   6 = No information

4. Frequency of Sexual Activities

   Which of the following best characterized the patient's usual frequency of sexual activities with another person during the past month?

   1 = At least 3 times weekly
   2 = At least once weekly
   3 = At least once monthly
   4 = Never
   5 = No information

D. RECREATION

At what level has the participant been involved in and able to enjoy recreational activities and hobbies (reading, spectator or participant sports, gardening, music, sewing, attending parties or gatherings, church or community organizations?)

1 = Very good, e.g., has at least 2 activities which he/she enjoys fully and frequently
2 = Good, e.g., participates in several activities and does not always enjoy them fully; or participates in fewer activities, or less frequently than optimal but enjoys participation
3 = Fair, e.g., occasional participation in recreational activities or hobbies, or limited enjoyment when participation occurs
4 = Poor, e.g., some participation in recreational activities or hobbies, and derives very little enjoyment from such activities
5 = Very poor, e.g., no involvement in recreational activities or hobbies.
6 = No information.

E. SATISFACTION

Satisfaction is intended to convey the patient's contentment with the various areas of functioning in his/her life, and not the actual level of functioning. This includes the gratification received from these activities, and the degree to which the patient thinks his/ her needs and desires are fulfilled.

1. Global Assessment of Satisfaction

Which of the following categories best characterized the participant's overall level of satisfaction (contentment, degree to which he/ she feels fulfilled, gratification derived from activities) for the past month?

1 = Very good, e.g., transient problems may occur, but generally satisfied with all aspect of his/ her life. Occasional minor dissatisfaction in one area, but overall is quite content with self, job, family, friends, activities, and finances.
2 = Good, e.g., mild dissatisfaction persists but only in one area, or is intermittent in several areas. In balance, is generally content and able to enjoy life most of the time, but does think there should be some improvement in either occupational role, interpersonal relations, sexual activities, or finances.
3 = Fair, e.g., moderate dissatisfaction in one or more areas, which is relatively persistent. Either discontent with occupational role, interpersonal relations, sexual activities, or finances.
4 = Poor, e.g., very dissatisfied in most areas and derives little pleasure from life. Rarely able to derive satisfaction from activities or relationships.
5 = Very poor, e.g., derives no satisfaction from anything. May feel no desire to carry out the smallest task, or to be with other people.
6 = No information.

2. Global Social Adjustment: Interviewer's Assessment

Taking into consideration everything you know about the patient, including education, social background, and the level of functioning in the areas of work, interpersonal relations, and sex, what would you consider his/her level of social adjustment over the past month?

1 = very good
2 = good
3 = fair (slightly impaired)
4 = poor (moderately impaired)
5 = very poor (markedly impaired)
6 = No information