# CHRONIC PSYCHOLOGICAL TRAUMA PREDICTS MENTAL AND PHYSICAL TRAUMA SYMPTOMS DIFFERENTIALLY BASED ON GENDER AND LEVELS OF RESILIENCE AND FORGIVENESS

by

WHITNEY KRISTIN JETER

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Major Professor
Brenda L. McDaniel

# Abstract

A large majority of trauma research focuses on relatively acute, physical trauma leading to the development of negative mental and physical trauma symptoms. Sometimes psychological trauma is measured concurrently with these instances of physical trauma. However, less is known about the impact of solely psychological trauma on mental and physical trauma symptom development. Moreover, chronic rather than acute psychological trauma is even more understudied. Therefore, the purpose of the current study was to address the gap of knowledge surrounding the impact of chronic psychological trauma on mental and physical health in young adults. The present inquiry was guided by two theoretical models: the Chronic Relational Trauma (CRT) Model and the Etiology of Psychopathology (EP) Model. The CRT Model posits a cyclical pattern of relational trauma perpetrated by caregivers, peers, and intimate partners. Relatedly, the EP Model focuses on acute physical trauma exposure leading to the development of negative mental and physical trauma symptoms as well as potential biological dysregulation with personality characteristics moderating these relationships. However, it is currently unknown how these moderating personality characteristics impact chronic psychological trauma. Thus, the current study blended these two theoretical models in order to examine the impact of chronic psychological trauma on mental, physical, and biological symptoms. One hundred and eighty young adults (*Mean age* = 18.53, *SD* = .70) were recruited for the current study. Participants completed a series of questionnaires and provided five total cortisol samples via oral swabs. Results indicate that after controlling for chronic physical trauma, chronic psychological trauma predicts mental trauma symptoms for females and males, but not physical trauma symptoms or biological dysregulation in cortisol. Further, levels of resilience, namely a sense of mastery and emotional reactivity as well as forgiveness significantly moderate the relationship

between chronic psychological trauma and mental and physical trauma symptoms for males and females differentially. Contributions of the current findings in terms of adding unique knowledge to trauma literature and future research projects are discussed.

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# Chapter 1 - Importance of the Problem

Traumatic events are commonly defined by psychologists as life-altering experiences that are unexpected, distressing, and disturbing (Kruczek, Vitanza, & Salsman, 2008). Herman (1997), a prominent trauma clinician, further specifies this definition by focusing on the detrimental effects of trauma stating "traumatic events overwhelm the ordinary systems of [self] care that give people a sense of control, connection, and meaning" (p.33). Terr (1991), a noted trauma research psychologist, has classified traumatic events into two different categories – acute and chronic. Traumatic events that fall under the acute category are single incidents which are relatively short-lived, such as those occurring during a single day or defined time period with a beginning and an end (e.g., natural disasters and witnessing a homicide.) On the other hand, the chronic category encompasses events that occur continuously or intermittently for long periods of time, such as years (e.g., childhood maltreatment by a caregiver and long-term exposure to community violence. Although previous research acknowledges the distinction of acute and chronic trauma, the majority of trauma research has focused on the first category of acute traumatic events while the second category of chronic trauma has received less empirical attention (Glaser, 2002; Herman, 1992; Streeck-Fischer & van der Kolk, 2000). This is surprising given that individuals reporting trauma rarely report just a single trauma experience but rather report experiencing multiple traumatic events (Kessler, 2000).

Similar to the lack of research on chronic traumatic events, the majority of the trauma literature has focused on physical trauma (e.g., being the recipient of punches or kicks,) with a lack of empirical investigation on psychological trauma (e.g., verbal name calling.) However, perhaps surprisingly, psychological trauma [sometimes termed psychological abuse (Street & Arias, 2001), emotional abuse (Loring, 1998), relational abuse/victimization (Crick, Casas, &

Nelson, 2002) or psychological/emotional neglect (Glasser, 2002; Spertus, Yehuda, Wong, Halligan & Seremetis, 2003)] is considered more common and just as damaging or more damaging to physical and mental health than physical trauma (Scott & Eliav, 2005). For example, women who have experienced domestic violence from an intimate partner, which is typically chronic in nature, report that psychological trauma from a partner is more harmful than physical trauma (Loring, 1998).

Additional instances regarding the impact of chronic psychological trauma can be seen in the childhood maltreatment literature. For example, one-third of children who have experienced chronic psychological trauma, as compared to 12% of children who have experienced an acute traumatic physical event, develop feelings of a pessimistic, hopeless future (Fletcher, 2003). Hopeless thoughts have been linked to mental trauma symptoms, such as higher rates of depression, anxiety, and lower levels of self-esteem (Ciesla & Roberts, 2007). Further, pessimism and hopelessness have consequences not only for mental health but also for physical health. The spirituality/religiosity literature shows a link between optimism, hope, and spirituality (Ai, Peterson, Tice, Bolling, & Koenig, 2004) as well as a link between religious involvement and lower rates of hypertension, heart disease, and stroke (McCullough, Hoyt, Larson, Koenig, & Thoresen, 2000). Given that cardiovascular disease is the leading cause of death worldwide (Mackay & Mensah, 2004) and depression affects nearly 1 in 10 United States adults (CDC, 2010), the investigation of chronic psychological trauma needs to be a priority for trauma researchers since it can play a contributing role in these damaging diseases/disorders.

Importantly, the investigation of chronic psychological trauma may be best served by first extensively studying a specific population. Within previous trauma research there appears to be some populations, such as young adults, who have higher rates of trauma exposure and, as

such, would be an ideal population for researchers to begin investigations of chronic psychological trauma. Research examining the prevalence of trauma among young adults indicates that almost 90% of college students in the United States experience at least one traumatic event before entering college (Bernat, Ronfeldt, Calhoun, & Arias, 1998; Green, 1995), such as the death of a loved one, a natural disaster, serious car accident, and/or combat exposure. Similarly, Vrana and Lauterbach (1994) found that over one-third of college students experience four or more acute physical and/or psychological traumatizing events before entering college. Nearly a decade and a half later, Elhai and Simons (2007) found a large increase of 90% of college students' experiencing multiple physical and/or psychological traumatic events prior to entering college. This extremely high prevalence rate of acute physical and psychological trauma exposure for college students suggests that exposure to traumatic events is a relatively common occurrence for young adults.

Even though there is a high prevalence rate of trauma exposure, data suggest that only a few college students (i.e., 8%,) develop posttraumatic stress disorder (PTSD; a psychiatric disorder occurring after experiencing or witnessing a life-altering, traumatic event; Norris, 1992). Despite the low occurrence of PTSD among college students, these traumatic events do contribute to trauma symptoms that include both negative mental and physical trauma symptoms. For example, 45 percent of college students are likely to experience the trauma symptom of depression following a traumatic event (Breslau, 2002). Further, researchers have demonstrated that trauma experiences contribute to physical maladjustment such as increased blood pressure and gastrointestinal problems (Schnurr & Green, 2004). Thus, even though a small percentage of college students may develop PTSD, a majority of students develop one or more mental and/or physical symptoms associated with trauma (Elhai & Simmons, 2007). However,

researchers are currently unable to predict when one person over another will develop one or multiple trauma symptoms.

Given the inability to predict the impact of traumatic events, researchers are faced with the challenge of identifying factors that could moderate the development of negative mental and physical trauma symptoms on an individual basis (Norris, 1992). Over the past three decades, researchers have turned to examining levels of personality characteristics, such as resilience (e.g., the capacity to persevere in the face of adversity or garner meaning after a traumatic event; Lopez, 2011; Rak & Patterson, 1996; Tedeschi & Calhoun, 2004) and forgiveness (e.g., a victim's reorientation of emotions, thoughts, and/or actions, such as a reduction in resentment following an offense that is seen as a beneficial and positive coping practice; Brown, 2003; Wade & Worthington, 2005) as ways to increase prediction of trauma symptom development (Brewin, Andrews, & Valentine, 2000). However, a majority of this literature looking at the moderating influence of personality characteristics has focused on acute, physical trauma rather than chronic, psychological trauma. Thus, as a whole, the present study addresses the current gap of knowledge in the trauma literature surrounding chronic psychological trauma, examines the impact of chronic psychological trauma on mental and physical trauma symptoms in college students, and investigates personality characteristics that could potentially moderate the negative impact of chronic psychological trauma.

In order to achieve these research goals, two theoretical trauma models were utilized – the Chronic Relational Trauma Model (CRT; Scott & Eliav, 2005) and the Etiology of Psychopathology Model (EP; Grant, Compas, Stuhlmacher, Thurm, McMahon, & Halpert, 2003). Both the CRT Model and the EP Model highlight the detrimental health impact of trauma

exposure. While these two theoretical models are similar in this respect, there are important differences that need to be noted.

The CRT Model (Scott & Eliav, 2005; Figure 1) was developed in an attempt to explain the cyclical progression of trauma exposure that can occur across the lifespan. The CRT Model has been predominantly used within the intimate partner violence literature as a way to explain why women enter and maintain unhealthy romantic relationships characterized by abuse (Scott & Eliav, 2005). This literature base focuses on physical and possible concurrent psychological trauma that women encounter throughout their lifetime; however, psychological trauma alone has yet to be tested within the CRT Model. Further, the efficacy of the CRT model for explaining the impact of male psychological trauma experiences through the lifespan also remains untested. Thus, the present study seeks to expand the applicability of the CRT Model by examining chronic psychological trauma, outside the context of physical trauma, in both females and males.

In contrast to the CRT Model, the EP Model (Grant, Compas, Stuhlmacher, Thurm, McMahon, & Halpert, 2003; Figure 2) has been used to explain how both acute and chronic trauma are related to not only negative mental trauma symptoms, but also negative physical trauma symptoms. Moreover, the EP Model outlines how personality characteristics can moderate the relationship between acute and chronic trauma and negative mental and physical trauma symptoms. This unique aspect of the EP Model has the potential to better explain why only certain individuals develop negative mental and/or physical trauma symptoms from trauma exposure. The present study draws from the EP Model's use of personality characteristics as possible attenuating factors for trauma symptoms and places the CRT Model as a predictor of mental and physical trauma symptoms within this model (see Figure 2). Thus, the present study

bridges both theoretical models to examine the impact of chronic psychological trauma occurring across the lifespan for females and males on negative mental and physical trauma symptoms while factoring in the moderating influence of personality characteristics. In order to understand the theoretical underpinnings of the current study, both theoretical trauma models and associated research findings are reviewed in greater detail in Chapter Two.

# Chapter 2 – Literature Review

## Chronic Relational Trauma Model

The CRT Model is a relatively recent theory (Scott & Eliav 2005,) however, the idea that trauma can persist chronically over time and lead to trauma-related symptoms has been posited previously in the literature through the theoretical concept of complex PTSD. Judith Herman (1992) developed the term complex PTSD to characterize the multifaceted nature of experiencing repetitive or chronic relational trauma (e.g., physical, sexual, and/or psychological trauma) and the development of negative mental and physical trauma symptoms. Research examining complex PTSD suggests that chronically traumatized individuals develop symptoms of hyper-vigilance and anxiety as exposure to relational trauma continues over time (Hilberman, 1980). Further, traumatized individuals suffer physical symptoms such as insomnia, headaches, gastrointestinal abnormalities, tremors, and frequent nausea (Herman, 1992). Chronically traumatized individuals also develop profound changes in identity, such as alterations in the structure of the self, alterations in internalized beliefs about others and alterations in the values and beliefs that provide a sense of purpose or meaning (Herman, 1992). Moreover, the experience of chronic trauma can negatively impact an individual's social interaction ability which can subsequently lead to increased vulnerability to repeated instances of relational trauma (Herman, 1992; Ozer, Best, Lipsey, & Weiss, 2003). Thus, the theoretical concept of complex PTSD supports a cyclical nature of relational trauma. That is, the experience of chronic relational trauma can lead to the development of both physical and mental trauma-related symptoms; the development of these symptoms can leave the individual vulnerable to experience further relational trauma over time.

As can be seen, complex PTSD is similar to the CRT Model (Scott & Eliav, 2003) in that chronic relational trauma can be maladaptive. However, the CRT Model is unique in that it specifically outlines how exposure to relational trauma during specific developmental periods, such as in early childhood, can lead to later relational trauma in the form of peer bullying victimization and intimate partner violence victimization (see Figure 1). Within the CRT Model, the experience of trauma across the lifespan is hypothesized to impact the development of trauma-related symptoms similar to the relationship posited in complex PTSD. Unlike complex PTSD, which focuses more on chronic instances over time by one perpetrator, the CRT Model focuses on multiple perpetrators of relational trauma across developmental periods within an individual's life, such as by caregivers, peers, and romantic partners.

To date, the CRT Model has been used to understand the impact of chronic relational trauma that stems from threats to the physical self or physical trauma (e.g., hitting, punching, and kicking; Mandoki & Burkhart, 1989; Urquiza & Goodlin-Jones, 1994; Wyatt, Gutherie, & Notgrass, 1992). However, this model has yet to be utilized within the context of threats to the psychological self or psychological trauma (e.g., name calling, love withdrawal, and "put-downs"). Thus, the purpose of using the CRT Model within the present study is to add to the trauma literature by testing the applicability of psychological trauma within this model. In order to make this application, relevant research findings surrounding psychological trauma will be placed in the context of the three developmental stages of the CRT Model.

### *Chronic Relational Trauma Model Cycle 1: Childhood Victimization*

Childhood maltreatment is a term commonly used to categorize four different and specific forms of trauma: physical trauma, sexual trauma, psychological trauma, and neglect (Zuravin, 1991). Historically, a majority of the childhood maltreatment literature has focused on

physical and sexual trauma with fewer research studies examining psychological trauma and neglect (Glaser, 2002). Since the current study seeks to fill gaps in the trauma literature surrounding psychological trauma, only childhood psychological trauma and neglect will be reviewed in detail.

Childhood psychological trauma involves verbal and/or physical neglect tactics aimed at making the child feel unloved, unwanted, unsafe, and worthless (Egeland, 1988). Childhood psychological trauma can be characterized as threats, verbal aggression (such as yelling or screaming), or the withholding of emotional support and care. Similarly, childhood neglect occurs when children do not receive proper care (e.g., shelter, schooling, clothing, and medical care) and/or are not provided protection by caregivers. Parental protection can include adequate supervision and protection from environmental dangers, such as exposure to drugs and violence (Wolfe, 1999). Neglect can result in the child feeling anxious and abandoned (Dubowitz, & Black, 2001).

Due to the similar impact on the child, childhood neglect and psychological trauma are often cited as being related (Spertus, Yehuda, Wong, Halligan & Sermetis, 2003). Psychological trauma and neglect are often the hardest forms of childhood maltreatment to recognize as scars or injury are not often visible, but rather these forms of trauma are internally damaging. Neglect itself can also result in a lower ability to detect psychological injury due to inaccurate caregiver reporting. Thus, the lack of visible injury and inaccurate caregiver reporting are likely why there has been limited research focusing on psychological trauma and neglect in childhood.

Even though research on childhood psychological trauma and neglect is sparse, current research findings support the need for this research to be conducted, because of the negative impact seen on children. Research has shown that childhood psychological trauma and neglect

(such as constantly being ignored, shamed, verbally terrorized, or humiliated) are more common and just as damaging, if not more damaging, forms of trauma than physical forms of childhood trauma (Glaser, 2002; Loring, 1998). Specifically, in 2007, the U.S. Department of Health and Human Services reported that in a sample of 899,000 youth, 63% reported experiencing psychological trauma and neglect compared to only 17% experiencing physical forms of trauma.

Beyond prevalence, other studies indicate that childhood psychological trauma and neglect elevate the risk for later health problems in adolescence and adulthood, similar to physical forms of trauma (Haven & Pearlman, 2004; Kendal-Tackett & Eckenrode, 1997). For example, Anda and colleagues (2002) found that neglect or insufficient care in childhood is linked to depression and alcoholism in adulthood. Similarly, Lesserman and colleagues (1998) found that childhood psychological trauma increases psychopathology and poor physical health outcomes in adulthood.

Researchers have found brain impairments within children exposed to psychological trauma and neglect, which could help explain this developmental trajectory for later problems. Specifically, children experiencing childhood psychological trauma and neglect show biological impairments in the area of the brain (i.e., cerebellar vermis) responsible for emotion control, which results in a diminished ability for emotion regulation (Hamby, 2004). This brain impairment has been linked to a host of mental and physical health problems, such as malnutrition, depression, anxiety, and substance abuse (Anderson, Teicher, Polcari, & Renshaw, 2002).

Beyond psychopathology and brain impairment, research has also shown that chronic psychological trauma and neglect are related to poor social-emotional development and these types of trauma can gradually erode healthy child development (Garbarino, 1994). Specifically,

studies have shown that psychological trauma perpetrated by caregivers during pre-school and elementary school years negatively impacts children's self-esteem, emotion regulation, and social abilities (Charuvastra & Cloitre, 2008). This negative impact that caregivers can have on children has been shown to be related to other negative relationship outcomes in the victim/child (Nelson Goff & Schwerdtfeger, 2004), such as an inability to establish and maintain peer relationships as well as future romantic relationships (Chamberland & Clement, 2009). Hence, a cyclical pattern of unhealthy relationships is established by this initial developmental period of childhood psychological trauma and neglect.

### *Chronic Relational Trauma Model Cycle 2: Peer Victimization*

Peer victimization is commonly defined as a more dominant individual tormenting a less dominant individual through physical, verbal, or psychological intimidation tactics intended to promote fear, distress, or harm (Farrington, 1993). Similar to the childhood victimization literature, research on peer victimization has traditionally focused on physical types of aggression with possible co-occurring psychological aggression rather than psychological aggression alone. This is likely due to the fact that injuries resulting from physical victimization are often easier for adults (e.g., teachers, principals, school counselors) to recognize and address than psychological victimization (Hanish & Guerra, 2004). As such, a variety of studies have grouped physical and psychological peer victimization together to predict consequential mental and physical health outcomes such as depression (Averdijk, Muller, Eisner, & Ribeaud, 2011), anxiety, withdrawal (Hodges & Perry, 1999), isolation, low self-esteem, a lack of hope (Pranjic & Bajraktarevic, 2010), as well as loss of appetite, nightmares, and sleep disturbances (Hand & Sanchez, 2000). In order to extend this research literature, the present study focuses on mental

and physical outcomes of peer psychological victimization alone, outside the context of peer physical victimization.

Not only has peer victimization been associated with negative mental and physical health outcomes, research studies have also demonstrated a connection between peer victimization and caregiver maltreatment. It has been well demonstrated that children who have been physically and psychologically maltreated by caregivers have difficulty relating to and interacting with peers (Baldry & Farrington, 2000; Connolly & O' Moore, 2003; Demaray & Malecki, 2003; Farrington, 1998; Georgiou, 2008; Lober & Stouthamer-Louber, 1986; Naylor, Petch, & Azam, 2011). As a result of this caregiver maltreatment, these already victimized children are at an increased risk of peer victimization due to poor social skills (Ahmed & Braithwaite, 2004). Similar to physical and psychological caregiver maltreatment, caregiver neglect can also lead to peer victimization for already victimized children. Caregiver neglect results in frequently missing school or school related activities creating long-term cognitive and academic impairments for children that often lead to peer-ridicule and victimization (Kendall-Tackett & Eckenrode, 1997). Studies also indicate that neglected children are generally unpopular (Stephenson & Smith, 1989) and likely to belong to rejected social groups (Hodges, Malone, & Perry, 1997). Consequently, neglected children that are victimized by peers are often low on the social ladder (Hanish & Guerra, 2004), have few friends (Crick & Bigbee, 1998; Kochenderfer & Ladd, 1996), are characterized as having low self-esteem (Egan & Perry, 1998), report feelings of loneliness (Hodges, Malone, & Perry, 1997), and display difficulties later in life, such as dropping out of school and criminal arrests (Bukowski & Cillessen, 1998).

This connection between caregiver maltreatment and peer victimization involves cycles of abuse across different developmental contexts (i.e., caregiver and peers) that are described

within the CRT Model (Scott & Eliav, 2005; see Figure 1). The reviewed research literature above supports this theorized relationship. Thus, the cyclic relational trauma across the lifespan hypothesized by the CRT Model (Scott & Eliav, 2005) is supported by numerous studies involving physical trauma, with possible co-occurring psychological trauma. However, it is currently unknown whether this theoretical model would be supported by examining psychological trauma, outside of the context of physical trauma, across the lifespan. Therefore, addressing this gap in knowledge is one of the goals of the present study. Next, findings surrounding romantic partner victimization are summarized and related to this theoretical model.

### *Chronic Relational Trauma Model Cycle 3: Intimate Partner Violence*

Intimate partner violence (IPV) is defined as "the use of actual or threatened physical, sexual, psychological, or stalking violence" by a current or former romantic partner (Basile, Arias, Desai, & Thompson, 2004, p. 413). Within heterosexual relationships, research suggests that men are more likely than women to be the perpetrators of physical aggression towards their romantic partners (i.e., pushing, punching, hitting; Bjorkqvist, 2004; Card, Stucky, Sawalani, & Little, 2008; Cross & Campbell, 2011). Physical acts of aggression by males towards female romantic partners have been shown to be related to increased mental and physical trauma symptoms (Cousins & Gangestad, 2007; Kaighobadi, Shackelford, & Goetz, 2009; Peter, Shackelford, & Buss, 2002; Shackelford, Buss, & Peter, 2000). Specifically, women who experience chronic physical trauma perpetrated by a male romantic partner are at an increased risk of developing mental trauma symptoms of depression, anxiety, and dissociation (Bonomi et al., 2006; Dienemann, Boyle, Baker, Resnick, Wiederhorn, & Campbell, 2000; Golding, 1999; Houry, Kemball, Rhodes, & Kaslow, 2006; Kessler, Chiu, Demler, Merikangas, & Walters, 2005; Nicolaidis, Curry, McFarland, & Gerrity, 2004; Sato-DiLorenzo & Sharps, 2007; Zlotnick,

Johnson, & Kohn, 2006), as well as physical trauma symptoms of insomnia and severe headaches (Mechanic, Uhlmansiefk, Waever, & Resick, 2000; Walker, 1984; Vitanza, Vogel, & Marshall, 1995). In fact, women who have experienced physical acts of trauma perpetrated by a male romantic partner are 33% to 84% more likely to have trauma symptoms, such as depression and anxiety than women who have not experienced these acts by male romantic partners (Astin, Lawrence, & Foy, 1993; Cascardi, O' Leary, Lawrence, & Schlee, 1995; Kemp, Rawlings, & Green, 1991). Overall, these research findings suggest that physical aggression by males against female romantic partners can result in the development of negative mental and physical trauma symptoms.

Although previous research has primarily focused on males as perpetrators of traumatizing aggression against their female romantic partners, research does suggest that females also use traumatizing aggression towards their male romantic partners (Archer, 2000; Cousins & Gangestad, 2007; Straus & Gelles, 1986). While males are more likely to utilize physical aggression against their female partners, females are more likely to utilize psychological aggression, such as indirect acts of manipulation, isolation, and exclusion against their male partners (Bjorkqvist, 2004; Card, Stucky, Sawalani, & Little, 2008; Cercone, Beach, & Ileana, 2005; Cousins & Gangestad, 2007; Cross & Campbell, 2011; Foshee et al., 1996; Gover, Kaukinen, & Fox, 2008; Straus, 2004). Research indicates that the use of psychological aggression by females against their male partners, such as flirting with the opposite sex or the use of the silent treatment (Holt & Espelage, 2005), has detrimental effects on males including increased mental trauma symptoms of depression and increased anxiety (Compian, Gowen, & Hayward, 2004), as well as increased jealousy (Linder, Crick, & Collins, 2002).

Even though certain types of traumatizing aggression may be more prevalent for specific genders within heterosexual relationships, it is not uncommon for perpetrators of violence in intimate relationships to use multiple forms of aggression, such as using both physical and psychological aggression concurrently, as commonly seen in male perpetration (Straus, 2008). Further, recent literature on heterosexual couples suggests the existence of a reciprocal, bidirectional, retaliatory violence where both males and females perpetrate physical as well as psychological aggression towards their partners as a response to aggression experienced from their partners (Basile, 2004). This recently reported bidirectional relationship of IPV, however, is still not fully understood within the literature (Fergusson, Horwood, & Ridder, 2005).

Although this bidirectional relationship of IPV is still not fully understood, the trauma field does agree that previous lifetime relational violence increases the likelihood of IPV. Research focused on caregiver maltreatment, involving chronic physical trauma, demonstrates that victimized children are at an increased likelihood of later romantic partner victimization (Wolfe, Scott, Wekerle, & Pittman, 2001). Moreover, numerous studies have indicated a strong relationship between a history of childhood and/or peer physical victimization and being a victim of physical acts of romantic partner violence in adulthood (Carr & VanDeusen, 2002; Coker, Smith, McKeown, & King, 2000; Grasley, Wolfe, & Wekerle, 1999; Herrenkohl, Mason, Kosterman, Lengua, Hawkins, & Abbott, 2004; Huefner, Ringle, Chmelka, & Ingram, 2007; Murphy & Blumenthal, 2000; Schafer, Caetano, & Cunradi, 2004; Stith, Rosen, Middleton, Busch, Lundeberg, & Carlton, 2000; Theriot, 2008; Widom & White, 1997). This research supports the theorized relationships within the CRT Model that individuals who experience caregiver and/or peer victimization are more likely to experience later IPV than individuals who

have not experienced these earlier traumas (Shields & Cicchetti, 2001; Wolfe, Scott, Wekerle, & Pittman, 2001).

Overall, the reviewed research on childhood victimization, peer victimization, and intimate partner victimization shows that the experience of chronic relational trauma at each cycle within the CRT Model can be detrimental to mental and physical health. However, this model is lacking information in regards to how individual differences can influence the progression of chronic relational trauma and associated trauma symptoms over time. The other central theoretical model used in the present study – the Etiology of Psychopathology (EP) Model – accounts for individual differences not examined within the CRT Model that can impact the development of mental and physical trauma symptoms following trauma. This unique aspect of the EP Model and relevant research findings regarding individual differences that can impact trauma symptoms are reviewed in detail.

## Etiology of Psychopathology Model

Similar to the literature supporting the CRT Model (Scott & Eliav, 2005), research also supports the individual hypothesized relationships within the EP Model (Grant, Compas, Stuhlmacher, Thurm, McMahon, & Halpert, 2003,) such as chronic physical trauma predicting depression symptoms with gender moderating this relationship (Davis, Burleson, & Kruszewski, 2011). Previous research indicates a clear link between experiencing chronic physical trauma and the development of psychopathologies including posttraumatic stress symptoms and related symptoms, such as depression, anxiety, disassociation, insomnia, and headaches (Goodyer, 2001; Igarashi, Hasui, Uji, Shono, Nagata, & Kitamura, 2010; McCloskey & Walker, 2000). Thus, the EP Model posits that chronic and acute physical trauma can increase mental and physical trauma symptoms. However, biological outcomes, such as dysregulation in the stress hormone cortisol

have yet to be tested within the EP Model. Importantly, a unique aspect of this model includes the examination of individual differences that can modify the relationship between trauma experiences and the development of negative trauma symptoms (see Figure 2). Previous research indicates that some personality characteristics, such as resilience can influence the development of mental and physical trauma symptoms as well as biological dysregulation. As such, examining the influence of personality characteristics on not only mental and physical trauma symptoms within the EP Model, but also biological dysregulation will add important information that is lacking in previous trauma literature.

Within the EP Model, moderators are commonly conceptualized as preexisting characteristics held prior to the experience of trauma (Holmbeck, 1997) that increase or decrease the likelihood of negative outcomes. Previous research indicates that personality characteristics such as resilience and forgiveness can decrease the development of trauma symptoms for females and males following trauma exposure, such as childhood victimization (Mrazek, & Mrazek, 1987; Snyder & Heinze, 2007), peer victimization (Ahmed & Braithwaite, 2006; Baldry & Farrington, 2005), and IPV (Gordon, Burton, & Porter, 2004; Werner-Wilson, Zimmerman, & Whalen, 2000. However, these findings suggest that the beneficial impact of resilience and forgiveness depends on gender, with females experiencing greater benefits than males in terms of developing less trauma symptoms.

Examining individual differences as moderators within the EP Model can potentially increase understanding of why only certain individuals develop negative mental, physical, and/or biological health outcomes from trauma exposure. As such, a goal of the current study was to utilize the EP Model as a guide in examining the moderating influence of resilience and forgiveness for females and males on the development of mental and physical trauma symptoms

as well as cortisol dysregulation following chronic psychological trauma. In the following sections, research findings surrounding the influence of gender, resilience, and forgiveness on mental and physical trauma symptoms and biological outcomes are reviewed.

### *Gender*

The trauma literature consistently cites gender as an important individual difference variable impacting the relationship between the experience of trauma and negative health outcomes (Grant et al., 2006). Findings suggest that although men are more likely than women to experience physical trauma[1] (Resick, 2001,) women have a higher lifetime prevalence rate of developing trauma symptoms following physical trauma (Breslau, Davis, Andreski, & Peterson, 1991; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995: Weaver & Clum, 1995). However, research suggests that these gender differences could be the result of women being more likely than men to report trauma experiences and subsequent trauma symptoms (Breslau, Davis, Andreski, Peterson, & Schultz, 1997; Breslau & Kessler, 2001; Norris, Foster, & Weisshaar, 2002; Perkonigg, Kessler, Storz, & Wittchen, 2000). These gender differences in the development of trauma symptoms could also be a function of the type of trauma that men and women are likely to experience (Crowell & Burgess, 1996; McMahon, Grant, Compas, Thurm, & Ey, 2003; Ruback & Thompson, 2001; Tjaden & Thoennes, 2000). Traditionally, research has focused on physical trauma for both men and women but the type of physical trauma may vary by gender. For example, women are more likely to experience physical trauma associated with an assault, such as a rape, whereas men are more likely to experience physical trauma associated with combat (Resick, 2001). However, less is known about how chronic psychological trauma across the lifespan impacts trauma-related symptom development in males and females (Reyes,

[1] These physical trauma experiences include combat exposure.

Elhai, & Ford, 2008). Because gender differences in the prevalence of trauma-related symptoms have been established within literature on physical trauma, it is important to investigate how chronic psychological trauma can impact the development of mental, physical, and biological trauma symptoms for females and males differently (or similarly) as well as how resilience and forgiveness serve as buffers to chronic psychological trauma for females and males. Thus, the present study examined gender as a variable that can impact the development of trauma symptoms as a result of chronic psychological trauma exposure and the moderating influence of resilience and forgiveness.

### *Resilience and Forgiveness*

Similar to gender, resilience (i.e., perseverance despite adversity) has been a popularly investigated individual difference variable in the trauma literature when examining the development of symptoms from trauma exposure (Masten, Cutuli & Reed, 2002). Previous research indicates that resilience can help to explain why some individuals experiencing traumatic events persevere in the face of adversity and why other individuals develop trauma-related symptoms (Jaffee, Caspi, Moffitt, Polo-Tomas, & Taylor, 2007). Following acute physical trauma, resilience is seen as a buffer against negative mental health outcomes, such as depression (Brewin, Andrews, & Valentine, 2000) as well as negative physical health outcomes, such as cardiovascular disorders (Connor, Davidson, & Lee, 2003). Further, resilience has been shown to alter the secretion of the stress hormone cortisol. Specifically, Mikolajczak and colleagues (2008) found that resilient individuals are more likely than non-resilient individuals to secrete less cortisol after completing a stressful task (i.e., preparing and delivering a speech). Together, these findings highlight the important role that resilience can have in decreasing negative outcomes as a result of acute physical trauma. However, the scientific literature

examining resilience as a protective factor from the development of negative symptoms stemming from chronic psychological trauma is limited (Margolin & Vickerman, 2007). Based on these previous findings, research examining how resilience can modulate the development of negative outcomes after chronic psychological trauma is needed.

In addition to resilience, forgiveness has been cited as a protective factor buffering the impact of acute physical trauma (Whited, Wheat, & Larkin, 2010). Throughout the literature, forgiveness is recognized as pro-social change, such as releasing resentment following an offense (Baumeister, Exline, & Sommer, 1998; Enright & Coyle, 1998; McCullough, 1997, 2007) related to decreased stress and positive health outcomes (e.g., increased physical, mental, relational, and spiritual well-being; Lawler, 2005; McCullough & Witvliet, 2002; Thoresen, Harris, & Luskin, 2000; Toussaint & Friedman 2009; Tseng, 2008; Worthington, 2005). With regard to trauma, forgiveness has been linked to positive psychological outcomes such as decreased anger rumination (Lawler, Karremans, Scott, Edlis-Matityahou, & Edwards, 2008), decreased depression (Enright, 2001), and decreased hostility (Witvliet, Ludwig, & Vander Laan, 2001). Furthermore, research suggests a link between a lack of forgiveness and negative physical outcomes, such as cardiovascular and immune system dysregulation, increased blood pressure, and increased heart rate following acute physical trauma (Witvliet, Phipps, Feldman, & Beckham, 2004). Although existing research does suggest that forgiveness is related to positive mental and physical outcomes after the experience of trauma, these findings are limited because studies have primarily focused on acute, physical experiences of trauma rather than chronic, psychological trauma (Orcutt, Pickett, & Pope, 2005). As such, the examination of forgiveness in relation to chronic psychological trauma could provide useful knowledge about how forgiveness possibly functions as a moderator in the development of trauma symptoms.

Overall, previous research shows that resilience and forgiveness can serve as buffers between the experience of acute physical trauma and the development of mental and physical trauma symptoms as well as biological dysregulation. As mentioned previously, resilience has been found to impact the secretion of the stress hormone cortisol following an acute physical trauma event (Mikolajczak, Roy, Luminet & de Timary, 2008). However, a gap in previous research utilizing the EP Model exists in that only mental and physical trauma symptoms have been tested as outcomes following acute and chronic physical trauma experiences. Additional psychopathologies, such as biological dysregulation in the stress hormone cortisol have not yet been tested as an outcome within this model. Given that previous research indicates that personality characteristics, such as resilience can influence cortisol secretion following acute, physical trauma, the present study addresses the lack of knowledge regarding biological dysregulation by examining the stress hormone cortisol as an outcome within the EP Model. Trauma research examining cortisol dysregulation in trauma exposed individuals and the collection methods utilized in this research are reviewed in the following section.

### *Cortisol Dysregulation*

The stress hormone cortisol is produced by the adrenal cortex and released in order to help the body adapt to stress. Cortisol plays an important role in regulating bodily functions such as blood pressure, cardiovascular and immune system functioning, as well as metabolism (Donnelly, Amaya-Jackson, & March, 1999). While the temporary elevation of cortisol helps individuals successfully manage stressful experiences, chronic elevation has detrimental effects on both neurophysiological and neuropsychological functioning (Cicchetti, 2003). For example, research findings indicate that hyperactivity of the stress response system has been associated with posttraumatic stress disorder, anxiety, and depression (Pico-Alfonso, Garcia-Linares, Celda-

Navarro, Herbert, & Martinez, 2004). The chronic release of cortisol can damage the physiological stress response system and result in abnormally low levels of cortisol. This result is typically seen in individuals experiencing prolonged or chronic trauma exposure (Ganzel, Eckenrode, Kim, Wethington, Horowitz & Temple, 2007). Because cortisol has been found to be highly associated with stress, assessing the level of cortisol circulating in the body is often cited as a good measure of stress (Kemeny, 2003).

Research indicates that in the body, roughly 1% to 15% of cortisol is separate from serum proteins in the blood (Robin, Predine, & Milgrom, 1977). Cortisol that remains separated from the serum proteins can enter the saliva through intracellular transmission (Vinning, McGinley, & Symons, 1983). However, research has shown a 20-minute delay between experiencing acute stressor and the ability to measure cortisol in an individual's saliva (Evans, Greaves-Lord, Euser, Franken, & Huizink, 2011). Research shows that cortisol in a participant's saliva is an accurate indicator of serum cortisol levels (Francis, Walker, Riad-Fahmy, Hughes, Murphy & Gray, 1987). Thus, measuring cortisol through an individual's saliva sample can be an accurate, noninvasive method of assessing circulating levels of cortisol. The present study relied on this saliva technique to gain a biological marker of stress (i.e., cortisol levels).

Beyond collection method, another key component to address in cortisol research is the time of day cortisol is collected. Previous research suggests that the amount of cortisol present in saliva changes as a function of diurnal variation similar to a circadian rhythm (Dorn, Lucke, Loucks, & Berga, 2007). Specifically, the diurnal variation in cortisol levels is consistent within research suggesting that on average, levels of cortisol production are highest (~ .4μg/dL) in the early morning (e.g., 6:30am to 7:30am) and drop to a lower level (less than .1μg/dL) at night (e.g., 10:00pm to 11:00pm; Deuschle, Schweiger, Weber, Gotthardt, Komer, & Schmider, 1997).

However, research has shown that the pattern of cortisol levels can decrease below typical averages as a function of acute physical trauma experiences. For example, individuals exposed to acute physical trauma and diagnosed with PTSD as a result of this trauma show significantly *lower* cortisol levels during the afternoon (e.g., 12pm) when compared to control groups of non-trauma exposed individuals (Meewisse, Reitsma, De Vries, Gersons & Olff, 2007; Yehuda, Teicher, Trestman, Levengood, Siever, 1996). The experience of trauma and the development of PTSD symptoms can deplete an individual's resources, including physiological resources, thus leading to lower levels of cortisol secretion in the afternoon.

Given previous research illustrating differences in biological outcomes for individuals exposed to acute physical trauma, current research is needed in order to examine the impact of chronic psychological trauma on biological outcomes. This research could add new knowledge to stress and trauma literature by allowing for researchers to better understand how trauma experiences differentially (or similarly) impact biological outcomes. Within the EP Model only mental and physical trauma symptoms have been examined. Thus, the current study will expand on previous trauma research by examining cortisol dysregulation as an outcome of chronic psychological trauma with gender, resilience, and forgiveness influencing this relationship.

## Summary and Research Hypotheses

In sum, the current study expands on trauma research that has primarily focused on acute physical trauma experiences by bridging the CRT Model and the EP Model. The purpose of using the CRT Model within the current study was to illustrate the detrimental impact of chronic psychological trauma on the development of trauma symptoms, such as depression, anxiety, insomnia, and headaches. Although this chronic trauma model has been used within previous trauma research to demonstrate that chronic physical trauma across the lifespan can lead to the

development of trauma symptoms, the impact of chronic psychological trauma has not yet been tested. Thus, the current study will examine the impact of chronic psychological trauma on trauma symptoms in order to add new knowledge to the trauma literature.

Furthermore, the purpose of using the EP Model within the current study was to examine the influence of the personality characteristics of resilience and forgiveness on trauma symptom development and biological dysregulation in females and males. The EP Model has been used in previous trauma research to illustrate how acute and chronic physical trauma events can impact the development of trauma symptoms with personality characteristics moderating this relationship; however, chronic psychological trauma has not yet been tested within this model. Moreover, how chronic psychological trauma can impact not only trauma symptoms, but also biological dysregulation has not yet been tested. The current study rectifies these gaps in literature by bridging the CRT Model and EP Model to examine the relationship between chronic psychological trauma and the development of mental and physical trauma symptoms as well as biological dysregulation (Figure 2). In accordance with previous research, gender as well as resilience, and forgiveness were expected to impact this relationship. The following research hypotheses were developed to empirically test these relationships within the bridged model.

H1: Chronic childhood, peer, and romantic partner psychological victimization, cited within the CRT Model, will be related.

H1a: Chronic psychological trauma perpetrated by caregivers will be positively correlated to psychological peer victimization and psychological intimate partner violence.

H1b: Psychological peer victimization will be positively correlated to romantic partner psychological victimization.

H2: The EP Model and the CRT Model will be predictive of mental and physical trauma symptoms and cortisol dysregulation.

H2a: Higher levels of chronic psychological trauma experiences will predict higher levels of mental trauma symptoms of depression, anxiety, dissociation, and sleep disturbances.

H2b: Higher levels of chronic psychological trauma experiences will predict higher levels of physical trauma symptoms of headaches, gastrointestinal issues, dizziness, and breathing problems.

H2b: Higher levels of chronic psychological trauma experiences will predict low levels of cortisol in the afternoon.

H3: Gender will differentially impact mental and physical trauma symptoms and cortisol dysregulation following chronic psychological trauma.

H3a: Females who have experienced higher levels of chronic psychological trauma, as compared to males, will have significantly higher levels of depression, anxiety, dissociation, sleep disturbances, headaches, gastrointestinal issues, dizziness, and breathing problems as well as low levels of cortisol in the afternoon.

H4: Resilience and forgiveness will moderate the relationship between chronic psychological trauma and the development of mental and physical trauma symptoms as well as cortisol dysregulation.

H4a: Individuals experiencing higher levels of chronic psychological trauma and higher levels of resilience will have significantly lower levels of depression, anxiety, dissociation, sleep disturbances, headaches, gastrointestinal issues, dizziness, and breathing problems as well as normal levels of cortisol in the afternoon.

H4b: Individuals experiencing higher levels of chronic psychological trauma and higher levels of forgiveness will have significantly lower levels of depression, anxiety, dissociation, sleep disturbances, headaches, gastrointestinal problems, dizziness, and breathing problems as well as normal levels of cortisol in the afternoon.

# Chapter 3 - Methodology

## Participants

Given previous research that suggests a high prevalence rate of trauma exposure in young adults (Elhai & Simons, 2007,) college students were selected for the current study. One hundred and eighty young adults (119 females; 61 males) from Kansas State University participated in the current study for introductory psychology course credit. In order to control for demographic variables that could be related to variables of interest, the following inclusion criteria were selected: each participant was 18 to 20 years of age, unmarried, and in a current romantic relationship or previously in a romantic relationship lasting at least three months. A majority of participants were 18 years of age (*Mean age* = 18.53, *SD* = .70), freshman classification (81%), and self-identified as Caucasian (75%). Fifty-seven percent of participants were in a current romantic relationship lasting at least three months. Participants were treated in accordance with research guidelines set forth by the American Psychological Association. Prior to data collection, participants were given an informed consent (see Appendix A) and a debriefing form at the end of the study (see Appendix B).

## Materials

Participants completed a survey packet asking for demographic information (see Appendix C) as well as information about events that occurred during childhood (childhood maltreatment, peer bullying victimization), events within romantic relationships (romantic partner victimization), and outlook on life (resilience, ability to forgive, and trauma symptoms). A 5-point Likert type scale ranging from "never" to "almost always" was used for each scale.

The *Childhood Trauma Questionnaire- Short Form* (*CTQ-SF*; Bernstein et al., 2003) was used to measure childhood maltreatment perpetrated by caregivers. The *CTQ-SF* (see Appendix D) is a retrospective measure containing five subscales (three subscales assessing psychological, physical and sexual maltreatment and two subscales measuring psychological and physical neglect). The sexual maltreatment subscale was not measured in the current study as it relates to sensitive material not relevant to current study goals, leaving 20 items measured total. High scores for each subscale indicate longer durations of maltreatment. Sample questions of psychological maltreatment include "I was called names by my family", "I was told by my parents, I wish you were not born", and "I felt hated by my family". Sample questions of the physical maltreatment subscale ($\alpha = .90$) include "I was hit hard enough by a family member to see a doctor" and "I was physically abused by a family member." In accordance with previous research indicating that psychological maltreatment and neglect (e.g., psychological and physical neglect) are commonly measured together (Spertus, Yehuda, Wong, Halligan & Sermetis, 2003), the psychological maltreatment, psychological neglect, and physical neglect subscales were combined in order to form a composite score of childhood psychological victimization ($\alpha = .93$).

The *Bully Victimization Scale* (*BVS*; Reynolds, 2003) was used to measure peer-victimization. The *BVS* (see Appendix E) is a retrospective measure designed to measure both bully behaviors and victimization occurring at or near school settings; however, the current study focused only on the victimization subscale and not the bully behaviors subscale. The victimization subscale includes 23 items measuring overt peer aggression (e.g., some kids hit or kicked me; $\alpha = .87$) and relational peer aggression (e.g., some kids teased me or called me names in school; $\alpha = .91$). Higher scores on the victimization subscales indicate longer durations of peer victimization towards the respondent.

The *Measure of Psychologically Abusive Behaviors* (*MPAB*; Follingstad, 2011) was used to measure psychological victimization within a romantic relationship (α = .96; see Appendix F). The *MPAB* consists of 78 items designed to measure severe psychological abuse victimization as well as psychological abuse perpetration. Although the *MPAB* measures both romantic partner psychological victimization and romantic partner psychological abuse perpetration, the current study focused only on the victimization subscale, leaving a total of 39 items measured. Sample questions include: "My partner harmed or destroyed my personal things of value (e.g., pictures, keepsakes, clothes, etc.) as a way to intimidate me," "My partner acted rude toward, gossiped about, or told lies about my family and friends to discourage me from spending time with them," and "My partner insulted or ridiculed me in front of others." Higher scores indicate longer durations of psychological abuse victimization in a romantic relationship.

The *Conflict Tactics Scale Version 2* (*CTS-2*; Straus, Hamby, Boney-McCoy, & Sugarman, 1996) was used to measure physical victimization within a romantic relationship (α = .76; see Appendix G). The *CTS-2* measures both romantic partner victimization and romantic partner abuse perpetration; however, the current study focused only on the 12 items from the physical victimization subscale. Example items include: "My partner threw something at me that could hurt," "My partner punched or hit me with something that could hurt," and "My partner slapped me." Higher scores indicate longer durations of physical abuse victimization in a romantic relationship.

The *Tendency to Forgive Scale* (*TTF*; Brown, 2003) was used to measure forgiveness (α = .76; see Appendix H). Four total items measured dispositional tendencies to forgive. An example item is "when people wrong me, my approach is just forgive and forget". High scores indicate a higher tendency to forgive.

The *Resiliency Scale for Adolescents* (*RSA*; Prince-Embury, 2007) was used to measure three domains associated with resilience (see Appendix I). The first domain on the *RSA*, sense of mastery, measured optimism (e.g., "no matter what happens, things will be alright,") self-efficacy (e.g., "if at first I don't succeed, I will keep on trying,") and adaptability (e.g., "I can learn from my mistakes;" $\alpha = .93$). The second domain, sense of relatedness, measured trust (e.g., "I can trust others,") support (e.g., "there are people who love and care about me,") comfort (e.g., "I feel calm with people,") and tolerance (e.g., "I can calmly tell others that I don't agree with them;" $\alpha = .94$). The third domain, emotional reactivity, measured sensitivity (e.g., "it is easy for me to get upset,") recovery (e.g., "when I get upset, I stay upset for the whole day,") and impairment (e.g., "when I get upset, I don't think clearly;" $\alpha = .90$). Sixty-four items were measured total. Higher scores on each subscale indicate higher levels of resilience.

The *Trauma Symptom Checklist* (*TSC-40*; Briere, & Runtz, 1989) was used to assess mental and physical trauma symptoms. The *TSC-40* (see appendix J) is a widely used measure evaluating severe trauma symptomology in adults due to traumatic experiences, such as chronic psychological maltreatment during childhood. The *TSC-40* is comprised of six subscales that include: sexual problems and abuse (excluded from the measure for the current proposal) as well as depression (e.g., "how often have you experienced uncontrollable crying in the past two months") anxiety (e.g., "how often have you experienced anxiety attacks in the past two months"), dissociation (e.g., "how often have you experienced feelings that you are not always in your body in the past two months"), and sleep disturbances (e.g., "how often have you experienced insomnia in the past two months"). A composite score was calculated for mental trauma symptoms using the depression, anxiety, dissociation, and sleep disturbances subscales ($\alpha = .92$). Eight total items were selected from the above subscales in order to measure physical

trauma symptoms (α = .79). Example items include: "how often have you experienced stomach problems in the past two months" and "how often have you experienced trouble breathing in the past two months." With the exclusion of the sexual problems and abuse scales, 32 total items were measured.

## Procedure

The current study was divided into two parts. For Part One of the study, participants were instructed to arrive at the research lab on either a Tuesday or Wednesday at 4pm to provide an initial cortisol sample via oral swab, lasting approximately three minutes. The time of 4pm was selected based on previous research examining diurnal cortisol levels (Young & Breslau, 2004), and the selected days were based on typically average-level stress days for college students. Next, participants completed a survey packet consisting of 194 items, and on average, took about 45 minutes to complete.

For Part Two of the study, participants were asked to provide three more cortisol samples via an oral swab while at their home. Participants were given detailed instructions for providing and storing the cortisol samples taken in their home (see appendix K). At the participant's home, one sample was provided between 8pm and 9pm that evening. Two more samples were given the following day. One sample when the participant woke up in the morning (between 8am and 9am) and the third sample 30 minutes later. Again, these times were selected based on previous research examining diurnal cortisol levels (Young & Breslau, 2004). Participants were instructed to return the three cortisol samples to the lab that day between 12pm and 1pm. Upon returning the three cortisol samples, one more cortisol sample was taken via oral swab for a total of five cortisol samples. The total time taken to complete Part One and Part Two of the current

study, accounting for survey and cortisol completion as well as cortisol delivery to the lab, took approximately two hours.

Overall, 900 frozen cortisol samples were analyzed (each sample was analyzed in duplicate for salivary cortisol using a high-sensitive enzyme immunoassay 510k for reliability purposes.) Previous research indicates that the distribution of cortisol is often positively skewed (Keene, 1995). As such, a log transformation was performed. Averages for each of the five time-points (e.g., 8am, 30 minutes after waking, 12pm, 4pm, 8pm) were calculated and cortisol samples taken during the afternoon (12pm) were used in the following cortisol analyses due to the ability to see differences in trauma exposed and non-trauma exposed individuals during this time (Meewisse, Reitsma, De Vries, Gersons & Olff, 2007).

# Chapter 4 – Analyses

## Descriptive Analyses

A between subjects, one-way analysis of variance examining the main effect of gender on chronic psychological trauma was conducted in order to discern significant mean differences in reporting trauma for females and males. Results indicate no significant differences in reporting on chronic psychological trauma for females and males [F (1, 178) = .06, $p$ = .81;] however, within the current sample, reports of chronic psychological trauma were low (see Table 1). Despite the relatively low psychological trauma rate that was reported, the results that follow are still discussed in terms of chronic trauma, due to the nature of the research hypotheses. Discussion surrounding the relatively low report of chronic psychological trauma within the current study is provided within the limitations and future direction section.

A multivariate analysis of variance was conducted in order to assess significant differences in reporting mental (e.g., depression, anxiety, dissociation, and sleep disturbance,) and physical trauma symptoms (e.g., headaches, gastrointestinal problems, breathing problems, and dizziness,) as well as cortisol dysregulation in the afternoon for females and males. Results of the analysis indicate a significant gender difference, such that females in the current sample reported significantly more mental [F (1, 178) = 6.77, $p$ = .01] and physical [F (1, 178) = 22.44, $p$ < .001] trauma symptoms compared to males. However, no significant gender differences were found in regards to cortisol dysregulation in the afternoon [F (1, 173) = .83, $p$ = .36; see Table 1].

Bivariate correlations were conducted in order to test hypothesis one (H1a and H1b) that chronic childhood, peer, and romantic partner psychological victimization, cited within the CRT Model, would be related. Results indicate that childhood psychological victimization was

positively correlated with peer psychological victimization [$r$ (180) = .32, $p$ < .001,] as well as romantic partner psychological victimization [$r$ (18) = .18, $p$ = .01,] thus supporting hypothesis 1a. Furthermore, psychological peer victimization was positively correlated to romantic partner psychological victimization [$r$ (180) = .35, $p$ < .001] supporting hypothesis 1b. Together, these results support the cyclical pattern of chronic psychological trauma within the CRT Model.

## Interpretative Analyses

A composite variable for chronic psychological trauma was calculated by creating a composite score for each participant on the subscales used to measure psychological trauma from the Childhood Trauma Questionnaire, Bully Victimization Questionnaire, and the Measure of Psychologically Abusive Behaviors Questionnaire. This composite variable was used in the following analyses (α = .95).

### *Chronic Psychological Trauma Predicts Mental and Physical Trauma Symptoms*

In order to examine hypothesis two, that higher levels of chronic psychological trauma would predict higher levels of mental trauma symptoms of depression, anxiety, dissociation, and sleep disturbances as well as physical trauma symptoms of headaches, gastrointestinal issues, dizziness, breathing problems, and cortisol dysregulation, bivariate correlations were conducted. Results indicate support for hypothesis two (H2a and H2b,) such that higher levels of chronic psychological trauma were related to higher levels of mental trauma symptoms [$r$ (180) = .58, $p$ < .001] and higher levels of physical trauma symptoms [$r$ (180) = .38, $p$ < .001]. Although results indicate that chronic psychological trauma is related to higher levels of mental and physical trauma symptoms, H2c was not supported. Chronic psychological trauma was not significantly related to lower levels of cortisol in the afternoon [$r$ (175) = .002, $p$ =.97]. Potential explanations for this finding, that chronic psychological trauma was not related to cortisol

dysregulation, are discussed in more detail within the limitations and future research section that follows. Despite chronic psychological trauma not being related to cortisol dysregulation in the afternoon, examination of hypothesis three, testing potential gender differences, adds important information to the significant findings above in relation to the differential impact of chronic psychological trauma and mental and physical trauma symptoms for females and males.

To examine the impact of chronic psychological trauma for females and males, six, hierarchical regression analyses were conducted. In accordance with previous research suggesting that physical trauma be controlled for when examining gender differences in trauma symptoms (Glaser, 2002), chronic physical trauma was entered in the first step of each regression analysis. Chronic physical trauma was developed as a composite variable using the physical trauma subscales from the Childhood Trauma Questionnaire, Bully Victimization Questionnaire, and the Conflict Tactics Questionnaire ($\alpha = .83$). Results of the regression analyses indicate that after controlling for chronic physical trauma, chronic psychological trauma predicted mental trauma symptoms for females [$F$ (2, 116) = 26.22, $p < .001$; $\beta = .43$; $\Delta R^2 = .08$] and males [$F$ (2, 58) = 28.17, $p = .04$; $\beta = .38$; $\Delta R^2 = .04$; see Table 2]. However, this same effect was not seen for physical trauma symptoms for females [$F$ (2, 116) = 11.73, $p = .27$; $\beta = .16$; $\Delta R^2 = .01$] or males [$F$ (2, 58) = 8.71, $p = .17$; $\beta = .31$; $\Delta R^2 = .03$; see Table 2] or cortisol levels during the afternoon for females [$F$ (2, 112) = .77, $p = .35$; $\beta = -.14$; $\Delta R^2 = .01$] or males [$F$ (2, 57) = 1.04, $p = .22$; $\beta = .32$; $\Delta R^2 = .03$; see Table 2].

### *Resilience and Forgiveness Modulate Chronic Psychological Trauma and Mental and Physical Trauma Symptoms Differentially based on Gender*

Following procedures from Holmbeck (1997) as well as Jaccard, Turrisi, and Wan (1990), hierarchical regression analyses were conducted for each gender by mental and physical

trauma symptoms. Specifically, resilience [measured using three subscales from the *RSA*, namely a sense of mastery (e.g., optimism, self-efficacy, and adaptability), a sense of relatedness (e.g., trust, support, comfort, and tolerance), and emotional reactivity (sensitivity, recovery, and impairment)] as well as forgiveness were examined as moderators of chronic psychological trauma and mental and physical trauma symptoms as well as cortisol levels in the afternoon for females and males. Based on the recommendations of Jaccard and colleagues (1990), the independent variable (composite score of chronic psychological trauma) and moderators (resilience and forgiveness) were centered (i.e., the mean of the variable subtracted from the raw score for participants) in order to reduce potential multicollinearity. Chronic physical trauma was entered as a covariate in the first step of all four regressions. In Step 2 of the regressions, the centered independent variable (chronic psychological trauma) and centered moderator (resilience and forgiveness) were entered. In Step 3, one two-way interaction term (computed by multiplying the centered independent variable by each moderator) between the independent variable and moderator were added.

***Resilience***

Examining the three components of resilience as moderators for females, results indicate that the relationship between chronic psychological trauma and mental trauma symptoms was not significantly moderated by a sense of mastery [$F$ (4, 114) = 21.60 , $p$ = .10; β = -.13; $\Delta R^2$ = .02], a sense of relatedness [$F$ (4, 114) = 21.24, $p$ = .10; β = -.14; $\Delta R^2$ = .01], or emotional reactivity [$F$ (4, 114) = 20.71, $p$ = .15; β = .11; $\Delta R^2$ = .01]. Similarly, the relationship between chronic psychological trauma and physical trauma symptoms was also not significantly moderated by a sense of mastery [$F$ (4, 114) = 7.15, $p$ = .74; β = .03; $\Delta R^2$ = .001], a sense of relatedness [$F$ (4, 114) = 5.83, $p$ = .97; β = -.003; $\Delta R^2$ = .001], or emotional reactivity [$F$ (4, 114) = 7.05, $p$ = .25; β

= -.01; $\Delta R^2$ = .01]. Finally, cortisol dysregulation in the afternoon was not significantly moderated by a sense of mastery [*F* (4, 110) = .61, *p* = .37; β = -.09; $\Delta R^2$ = .01,] sense of relatedness [*F* (4, 110) = .84, *p* = .45; β = -.08; $\Delta R^2$ = .01,] or emotional reactivity [*F* (4, 110) = .85, *p* = .50; β = .06; $\Delta R^2$ = .004].

For males, results suggest that the relationship between chronic psychological trauma and mental trauma symptoms was not significantly moderated by a sense of mastery [*F* (4, 56) = 14.65, *p* = .15; β = .15; $\Delta R^2$ = .02], a sense of relatedness [*F* (4, 56) = 14.67, *p* = .14; β = .17; $\Delta R^2$ = .02], or emotional reactivity [*F* (4, 56) = 17.92, *p* = .61; β = .08; $\Delta R^2$ = .002]. Further, the relationship between chronic psychological trauma and physical trauma symptoms was not significantly moderated by a sense of relatedness [*F* (4, 56) = 5.36, *p* = .07; β = .23; $\Delta R^2$ = .04]. However, this relationship was significantly moderated by a sense of mastery [*F* (4, 56) = 6.21, *p* = .02; β = .32; $\Delta R^2$ = .07], and emotional reactivity [*F* (4, 56) = 8.10, *p* = .04; β = -.42; $\Delta R^2$ = .05,] such that males reporting higher levels of chronic psychological trauma and higher levels of a sense of mastery also reported higher levels of physical trauma symptoms (see Figure 3). Further, males reporting higher levels of chronic psychological trauma and higher levels of emotional reactivity reported lower levels of physical trauma symptoms (see Figure 4). Finally, cortisol dysregulation in the afternoon was not significantly moderated by a sense of mastery [*F* (4, 55) = .61, *p* = .51; β = -.09; $\Delta R^2$ = .01,] sense of relatedness [*F* (4, 55) = .89, *p* = .74; β = -.06; $\Delta R^2$ = .002,] or emotional reactivity [*F* (4, 55) = .98, *p* = .70; β = -.09; $\Delta R^2$ = .003].

***Forgiveness***

Using forgiveness as a moderator, results indicate that for females, forgiveness significantly moderates the relationship between chronic psychological trauma and mental trauma symptoms, such that females reporting higher levels of chronic psychological trauma and

forgiveness also reported lower levels of mental trauma symptoms [$F$ (4, 114) = 19.63, $p$ = .03; β = -.17; $\Delta R^2$ = .03; see Figure 5]. However, forgiveness did not significantly moderate the relationship between chronic psychological trauma and physical trauma symptoms [$F$ (4, 114) = 5.78, $p$ = .85; β = .02; $\Delta R^2$ < .001] or cortisol dysregulation [$F$ (4, 110) = 1.21, $p$ = .20; β = -.13; $\Delta R^2$ = .01] for females. In contrast, for males, forgiveness significantly moderated the relationship between chronic psychological trauma and physical trauma symptoms, such that males reporting higher levels of chronic psychological trauma and forgiveness also reported higher levels of physical trauma symptoms [$F$ (4, 56) = 7.26, $p$ = .01; β = .44; $\Delta R^2$ = .10; see Figure 6]. However, forgiveness did not significantly moderate the relationship between chronic psychological trauma and mental trauma symptoms [$F$ (4, 56) = 14.41, $p$ = .39; β = .11; $\Delta R^2$ = .01] or cortisol dysregulation [$F$ (4, 55) = .57, $p$ = .61; β = .09; $\Delta R^2$ = .01] for males.

# Chapter 5 – Discussion

The goal of the current study was to examine the relationship between chronic psychological trauma and personality variables of resilience and forgiveness on mental, physical, and biological outcomes using the CRT Model and the EP Model as a guide. The CRT Model has been used within previous research focused on physical trauma exposure for females. Chronic psychological trauma, however, has yet to be tested within this model as well as the impact that chronic psychological trauma can have for both females and males. Hence, the purpose of applying the CRT Model within the current study was to expand on previous research focusing mainly on physical trauma exposure in order to demonstrate the detrimental impact of psychological trauma. Furthermore, The EP Model has been used in previous research examining the relationship between both acute and chronic physical trauma and the influence of personality characteristics; however, this relationship has not been tested using chronic psychological trauma. The current study remedies the limited research on chronic psychological trauma by bridging both models with the purpose of learning more about how chronic psychological trauma, resilience, and forgiveness interact to influence mental, physical, and biological outcomes in females and males.

Because a large majority of trauma research has focused on acute, physical types of trauma, the current study adds new knowledge to trauma literature and theory in several ways. First, results of the current study regarding gender differences in reporting mental and physical trauma symptoms are similar to findings within the physical trauma literature. Within the current study, results suggest a significant gender difference in trauma symptoms, such that females in the current sample reported significantly more mental and physical trauma symptoms than males, although there were no significant gender differences in reporting experiences of

chronic psychological trauma. In accordance with previous research examining physical types of trauma, this finding is not surprising given that females typically have a higher lifetime prevalence rate of developing trauma symptoms, such as depression, anxiety, and physical health complaints following physical trauma (Breslau et al., 1991; Kessler et al., 1995). Although not surprising, the finding that females within the current study reported more mental and physical trauma symptoms than males adds beneficial information to trauma literature in general regarding the processing of trauma experiences in both genders. Even though females reported significantly more trauma symptoms than males, additional findings within the current study indicate that males were still impacted by chronic psychological trauma in terms of developing trauma symptoms. This finding suggests that perhaps the processing of trauma may not be radically different for females and males in terms of developing trauma symptoms. Instead females may just be more likely to report mental and physical trauma symptoms than males in general on self-report questionnaires, and on average, females may be more aware of the trauma symptoms they experience, such as frequent crying or increased feeling of loneliness, and physical health complaints than males.

Second, for both females and males, chronic psychological trauma impacted different trauma symptoms within the current study. For instance, results indicate that after controlling for chronic physical trauma, chronic psychological trauma significantly predicted mental trauma symptoms for both genders. This relationship was not found when examining chronic psychological trauma and physical trauma symptoms or cortisol levels in the afternoon in females and males. This significant finding is consistent with previously established physical trauma literature in regards to mental trauma symptom development (McMahon, Grant, Compas, Thurm, & Ey, 2003; Resick, 2001). However, the non-significant finding regarding chronic

psychological trauma and physical and biological outcomes stands in contrast to previous physical trauma literature (Elhai & Simmons, 2007). Because less is known within the trauma literature about the impact of chronic psychological trauma and mental, physical, and biological outcomes in females and males (Reyes, Elhai, & Ford, 2008) these findings contribute valuable knowledge to existing literature. Importantly, psychological trauma has been cited in previous trauma literature as being more internally as opposed to externally damaging, and not easily recognized because symptoms are not always visible (Glaser, 2002). As such, the findings within the current study that mental trauma symptoms, often characterized as more internally damaging, were predictive of chronic psychological trauma suggests that the type of trauma that is measured is critical in predicting the development of mental, physical, and/or biological symptom formation for both females and males.

Third, results of the current study investigating psychological trauma are not only consistent with regard to previously established gender differences in trauma literature, but also consistent with previous research using the CRT Model and EP Model. Within the current study, chronic psychological victimization was positively correlated with peer psychological victimization as well as romantic partner psychological victimization, and peer psychological victimization was also positively correlated to romantic partner psychological victimization. These results support the cyclical pattern of trauma within the CRT Model and add new knowledge to this model about the cyclical progression of psychological trauma beyond the knowledge on physical trauma. That is, results of the current study reveal a similar impact of chronic psychological trauma to that of chronic physical trauma within the CRT Model. Given the maladaptive impact of experiencing chronic physical trauma on health, such as unhealthy child and adolescent development (Garbarino, 1994), this new information about chronic

psychological trauma progressing across the lifespan of young adults has important implications for future trauma and health literature.

Finally, in addition to expanding the CRT Model to psychological trauma, findings of the current study also expand on the EP Model. A majority of previous research utilizing this model has focused on physical trauma in the prediction of negative mental and physical trauma symptoms. Results from the current study indicate that exposure to chronic psychological trauma also significantly predicts negative mental and physical trauma symptoms, however, this result varied based on gender and levels of resilience and forgiveness. Thus, the current findings highlight the detrimental relationship between chronic psychological trauma and trauma symptoms as well as how individual differences can impact this relationship. Identifying factors that individually moderate the development of mental and physical trauma symptoms has been a challenge for trauma researchers (Norris, 1992). The current study advances trauma literature and can serve to aid future research endeavors by demonstrating that gender and the specific personality characteristics of resilience and forgiveness influence the relationship between chronic psychological and mental and physical trauma symptoms.

While some of the present findings do support previous research, some contradictory findings were also found regarding resilience and forgiveness. Following acute trauma for both females and males, resilience has been recognized in the literature as a buffer or protective factor against negative mental trauma symptoms, such as depression (Brewin, Andrews, & Valentine, 2000) as well as negative physical trauma symptoms, such as cardiovascular disorders (Connor, Davidson, & Lee, 2003). Results of the current study suggest that certain domains of resilience, namely a sense of mastery and emotional reactivity, may not necessarily serve as buffers against negative trauma symptoms when experiencing chronic psychological trauma. More specifically,

for males, the current study indicates that higher levels of chronic psychological trauma and higher levels of a sense of mastery are related to higher levels of physical trauma symptoms. Further, also for males, higher levels of emotional reactivity (i.e., low resilience) were associated with lower levels of physical trauma symptoms. These results raise several interesting questions regarding the beneficial impact of resilience on trauma symptoms following chronic trauma including: why higher levels of optimism and self-efficacy would be related to higher physical trauma symptoms and why higher emotional reactivity (e.g., less resilience) would be related to lower physical trauma symptoms for males. Interpretations of the finding that an increased sense of mastery (e.g., optimism, self-efficacy, and adaptability) is related to higher levels of physical trauma symptoms in males can be drawn from previous literature on coping and stress.

Within coping literature, even seemingly positive coping practices, such as high optimism can be detrimental to health, such as increasing physical exhaustion and decreasing immune system functioning (Carver & Scheier, 1993; Riolli, Savicki, & Cepani, 2006). Individuals who experience trauma, compared to individuals not experiencing trauma, yet continually engage in positive coping practices, such as believing that the future will be positive in spite of struggle, report experiencing at least some negative health outcomes, such as depression and immune system dysregulation when trauma persists over time (Colvin & Block, 1994). The key to this research is the overuse (e.g., bordering on unrealistic optimism) of a sense of mastery that can increase health problems when challenges persist over an extended period of time. In relation to the findings of the current study, males who had higher levels of a sense of mastery appear to persevere despite the chronic nature of trauma and were at an increased risk for physical trauma symptoms.

Furthermore, previous stress literature suggests that males, more so than females, exhibit a higher tolerance to physical health problems, such as headaches when faced with stressful experiences; however, this gender difference is mediated by levels of self-efficacy (Jackson, Iezzi, Gunderson, Nagasaka, & Fritch, 2002). That is, males with higher levels of self-efficacy are more likely than females to persevere despite challenges even while having physical health problems (Miller & Newton, 2006). A heightened sense of self-efficacy is commonly related to behaviors that highlight perseverance. In other words, high self-efficacy can make individuals more persistent and increase tolerance for negative trauma symptoms. It is reasonable to assume that within the current study, males who have higher levels of a sense of mastery (including self-efficacy and optimism) would perceive that they can tolerate physical health problems and persevere even in the face of chronic psychological trauma. Together, these findings suggest that a sense of mastery may not always be a beneficial buffer to physical trauma symptoms, especially for males.

In addition to a sense of mastery being a significant moderator within the current study, emotional reactivity (e.g., sensitivity, recovery, and impairment) was also found to significantly moderate the relationship between chronic psychological trauma and physical trauma symptoms for males. Males reporting higher levels of chronic psychological trauma and emotional reactivity also reported lower levels of physical trauma symptoms. This result stands in contrast to present predictions that individuals higher in emotional reactivity would report higher levels of health problems following chronic psychological trauma. Stress research focusing on inoculation theory (or inoculation to stress and trauma) indicates that individuals who experience trauma over time typically report less health problems, because they have inoculated to the trauma (Fergus & Zimmerman, 2005; Khoshaba & Maddi, 1999; Lyons & Parker, 2007).

Research suggests that some adults cope better with traumatic events, such as the loss of a spouse or serious illness if they have previously experienced and coped with traumatic events during childhood (Mortimer, & Staff, 2004). In other words, exposure to chronic trauma serves to inoculate or "toughen-up" individuals when that individual overcomes the traumatic experience. Within the current study, males who reported being more naturally emotionally reactive, but also reported experiencing chronic trauma could be inoculated by the trauma experiences, and thereby, report less physical trauma symptoms. Males within the current study who reported little to no chronic trauma and high emotional reactivity also reported high physical trauma symptoms. This later finding indicates potential support for inoculation theory that the experience of chronic trauma can potentially decrease physical trauma symptoms in males. In terms of the CRT Model that suggests with each cycle of trauma, trauma symptoms develop and/or persist leading to further trauma across the lifespan, this finding has important implications for future research using this model. Physical trauma across the lifespan has been examined within the CRT Model for females; however, this model has not examined how trauma and personality characteristics can impact males. Given the current findings, chronic trauma and resilience may not impact females and males similarly, and chronic trauma, specifically psychological trauma, across the lifespan for males may not lead to increased trauma symptoms. The current findings add preliminary, yet important, information in regards to the differential impact of chronic psychological trauma and resilience on trauma symptoms. However, future research is needed in order to better understand this relationship for both genders.

Similar to resilience, forgiveness significantly moderates the relationship between chronic psychological trauma and mental and physical trauma symptoms differentially based on gender. For females, higher levels of chronic psychological trauma and higher levels of

forgiveness were related to *lower* levels of *mental* trauma symptoms. For males higher levels of chronic psychological trauma and forgiveness were related to *higher* levels of *physical* trauma symptoms. The finding that higher levels of forgiveness influenced lower levels of mental trauma symptoms for females following chronic psychological trauma is supported by previous physical trauma literature. For example, research examining gender differences in trauma symptom formation following childhood physical victimization (Mrazek, & Mrazek, 1987; Snyder & Heinze, 2007), peer physical victimization (Ahmed & Braithwaite, 2006; Baldry & Farrington, 2005), and romantic partner physical victimization (Gordon, Burton, & Porter, 2004; Werner-Wilson, Zimmerman, & Whalen, 2000) indicates that females, more so than males, encounter greater benefits of forgiveness, such as lower trauma symptoms. The finding within the current study that higher levels of forgiveness were related to lower mental trauma symptoms for females adds to this research by demonstrating that psychological trauma impacts trauma symptom formation similarly to physical trauma.

In addition, the finding associated with the impact of forgiveness in males also adds potential knowledge to previous trauma literature. It was initially expected that forgiveness would serve as a protective factor buffering against the development of trauma symptoms for both females and males, with females experiencing greater benefits than males. This expected result, however, was not supported within the current study for males. Although there is a body of forgiveness research that indicates general (or dispositional) tendencies to forgive are related to mental and physical health benefits (Brown, 2003) there is another body of forgiveness literature that suggests different components or processes of forgiveness that need to occur in order for health benefits to ensue (Holmgren, 1993; North, 1987). This literature on the process of forgiveness is less clear and less consistent compared to dispositional forgiveness literature,

mainly because there are several different factors associated with the process of forgiveness, such as if an apology is or is not offered following an offense (Enright, 2001). These inconsistencies were why the present study examined dispositional forgiveness. However, the literature on components or processes of forgiveness sheds light on the findings of the current study. This research indicates that although an individual might be more likely to forgive than others (e.g., dispositional forgiveness measured within the current study) genuine or sincere forgiveness might still be lacking following a transgression (Holmgren, 1993). Past research on genuine forgiveness, defined as both externally forgiving a transgression or offense (e.g., openly letting go of resentment towards a transgression or transgressor, outward show of good-heartedness) as well as internal forgiveness (e.g., releasing negative emotions associated with the transgression, experiencing internal peace regarding a transgression) indicates that individuals who engage in merely external forgiveness, but not internal forgiveness, do not experience the same health benefits as those who both externally and internally forgive (North, 1987; Witvliet & McCullough, 2007). The term "stuffing" has been developed in this literature to highlight how detrimental internally repressing negative emotions can be even if external forgiveness has been granted (Freedman, 2012). Interestingly, females, in general, are more likely to report dispositional forgiveness and are more likely to report genuine forgiveness practices than males (Witvliet & McCullough, 2007). Thus, this could be a potential explanation for why females in the current study appeared to benefit from forgiveness following chronic trauma while males did not. The effects found within the current study examining forgiveness in relation to chronic psychological trauma and trauma symptoms for females and males contributes useful knowledge about how forgiveness functions as a moderator for differing types of trauma. Continued research in this area would be beneficial in further explaining the effects of forgiveness

(tendencies to forgive as well as differing components of forgiveness, such as external and internal components) on trauma symptoms following chronic psychological trauma for females and males.

## Limitations and Future Research

Although results of the current study add new knowledge to previous trauma research, limitations need to be addressed. First, the sample used in the current study represents a typical college sample in which diversity, in terms of age and ethnicity, was limited. In future studies, efforts towards recruiting a more diverse sample could provide additional information about the impact of psychological trauma on health. Second, levels of reported psychological trauma were low within the current sample, with a majority of participants indicating that they rarely experienced psychological trauma perpetrated by caregivers, peers, and romantic partners (see Table 1). The low trauma levels within the current sample of young adults is surprising given previous literature that suggests college-age students are likely to have experienced previous psychological trauma before entering college (Elhai & Simons, 2007; Glaser, 2002). This low reported trauma rate could be due to several things including: the age restriction placed on research participants, the nature of the trauma events that were assessed, and the method of collection.

Within the current study, participants were required to be between 18 to 20 years of age. This age restriction was created in order to produce a more homogenous sample; however, the limited age variability of participants (*Mean age* = 18.53, *SD* = .70) could have contributed to low reports of trauma. Furthermore, only physical and psychological types of trauma were assessed within the current study. Sexual trauma was not examined given the sensitive nature of sexual maltreatment items. However, young adults, especially females, are likely to experience

sexual victimization as well as physical and psychological victimization (Resick, 2001). Moreover, participants were asked to complete surveys in front of a researcher in a small group containing about ten other participants. Therefore, it is possible that participants within the current study did not feel comfortable accurately reporting on past psychologically traumatizing experiences. In future studies examining psychological trauma, surveys (including physical, sexual, and psychological trauma) completed on-line and in the privacy of a participant's home may help to alleviate feelings of discomfort and lead to more accurate reporting of trauma experiences.

Even though a majority of participants reported rare experiences of psychological trauma within the current study, these rare occurrences still appear to be impactful in terms of predicting mental and physical trauma symptoms. Effects of the analyses using chronic psychological trauma as a predictor of mental and physical trauma symptoms were significant. However, within the current study, the duration of the psychologically traumatizing event rather than the severity of the traumatic event was measured. As such, follow-up studies are needed in order to more fully explain the impact of chronic psychological trauma on mental and physical trauma symptoms in young adults.

Moreover, findings of the current study did not reveal a significant relationship between chronic psychological trauma and cortisol levels in the afternoon for females and males. Findings also did not indicate significant moderation between resilience and forgiveness, chronic psychological trauma, and cortisol levels. This lack of relationship could be due to the low levels of psychological trauma that were reported by participants of the current study. Previous research examining cortisol primarily focuses on individuals diagnosed with PTSD. Although PTSD was measured within the current study using the Posttraumatic Stress Disorder Checklist

(PCL; Weathers & Ford, 1996) participant's scores on this measure did not meet the cut-point for PTSD (i.e., a score ranging from 35-50 meets the screening cut-point for a diagnosis of PTSD) and were not used in the current study's analyses. Thus, the low trauma and low reported PTSD symptoms might have influenced the lack of relationship between psychological trauma and cortisol during the afternoon.

In addition to low levels of trauma and PTSD symptoms, cortisol levels in the afternoon were examined in the current study as a continuous variable within each analysis, because of the nature of the research hypotheses. Given the diurnal curve that is used to measure cortisol secretion, perhaps the analysis of cortisol levels would be better served not through continuous, linear relationships as was the case in the current study, but instead through curvilinear relationships. In future studies, cortisol levels could be calculated as a categorical variable with differing levels of severity for afternoon collection, such as abnormally low levels, average levels, and abnormally high levels. Despite the lack of relationships found in the current study, future research is needed in order to better understand the relationship between cortisol secretion and chronic psychological trauma for females and males.

As a whole, findings from this study expand on previous trauma research that has mainly focused on physical types of trauma in spite of the above limitations. After controlling for physical trauma, results of the current study suggest that psychological trauma is impactful in predicting negative mental trauma symptoms for females and males. The current study also contributes new knowledge to the theoretical models that were used by showing the negative impact of psychological trauma on mental and physical trauma symptoms and how the personality characteristics of resilience and forgiveness influence this relationship differentially for females and males. Overall, the findings of the current study highlight a potentially

detrimental impact of psychological trauma on health. As such, future studies investigating the impact of psychological trauma are warranted and could lead to potential interventions for psychologists hoping to ease negative mental and physical trauma symptoms and improve the general coping skills of psychologically traumatized young adults.

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# Appendix A

## KANSAS STATE UNIVERSITY: INFORMED CONSENT

**PROJECT TITLE:** **Stress in Young Adults Project**

**APPROVAL DATE OF PROJECT: 4/20/2012** **EXPIRATION DATE OF PROJECT: 4/20/2013**

**PRINCIPAL INVESTIGATOR:** **Brenda Lee McDaniel, Ph.D.**

**CONTACT FOR ANY PROBLEMS/QUESTIONS:** **Whitney Jeter, Department of Psychology, 562 Bluemont Hall, Kansas State University, Manhattan, KS, 66505, (817) 798-2025, wjeter@ksu.edu**

**IRB CHAIR CONTACT/PHONE INFORMATION:**

- **Rick Scheidt, Chair, Committee on Research Involving Human Subjects, 203 Fairchild Hall, Kansas State University, Manhattan, KS 66506, (785) 532-3224.**
- **Jerry Jaax, Associate Vice Provost for Research compliance and University Veterinarian, 203 Fairchild Hall, Kansas State University, Manhattan, KS 66506, (785) 532-3224.**

**PURPOSE OF THE RESEARCH:** **Understand the impact of stressors experienced during childhood, adolescence and young adulthood on the development of stress related symptoms as well as the impact of stressors on biological functioning in young adults.**

**PROCEDURES OR METHODS TO BE USED:** **You will complete surveys about events that occurred during childhood, events within your peer and romantic relationships, and your outlook on life. Your participation will also involve giving a spit sample in the lab by placing a cotton swab in your mouth for 3-minutes. This procedure is not painful or uncomfortable. You will also be asked to provide three more spit samples at home and return these samples to the lab the following day. One sample between 8pm-9pm, one sample upon waking up the following morning between 8am and 9am, and one sample 30 minutes after waking up.**

**LENGTH OF STUDY:** **Completion of the surveys will take less than 60 minutes. Providing one spit sample in the lab will take less than 15 minutes. Providing three additional spit samples at your home and returning those samples to the lab the following day will take 45 minutes.**

**RISKS ANTICIPATED:** **No known risks are expected.**

**BENEFITS ANTICIPATED:** **Your responses will help the scientific community understand how stress experienced during childhood and within peer and romantic relationships can impact the development of stress related symptoms in young adulthood. Results will also help researchers understand physical responses to stress and how it relates to self-reported levels of stress.**

**EXTENT OF CONFIDENTIALITY:** **The responses you provide will not be associated in any way with your name or identity. The only record of your participation in this study will be your signed consent. This consent form will not be linked with your data. The spit sample that you provide will not be analyzed for anything other than the stress hormone cortisol. The sample you provide will be destroyed after analysis.**

**PARENTAL APPROVAL FOR MINORS:** **You must be at least 18 years old to participate in this study. If you are under the age of 18, you must present parental or guardian approval before participating.**

**TERMS OF PARTICIPATION: I understand this project is research, and that my participation is completely voluntary. I also understand that if I decide to participate in this study, I may withdraw my consent at any time, and stop participating at any time without explanation, penalty, or loss of benefits, or academic standing to which I may otherwise be entitled.**

**I verify that my signature below indicates that I have read and understand this consent form, and willingly agree to participate in this study under the terms described, and that my signature acknowledges that I have received a signed and dated copy of this consent form.**

**Participant Name:** _____

**Participant Signature:** _____ **Date:** _____

**Witness to signature:** _____ **Date:** _____

## Appendix B

Debriefing

The present study examines the impact of stress that may be present during childhood (perpetrated by caregivers), in adolescence (perpetrated by peers), and in young adulthood (perpetrated by a romantic partner). Gender, resilience, and forgiveness were used in the current study as variables related to the experience of stress and the development of stress related mental and physical symptoms (depression, anxiety, dissociation, sleep disturbances, stomach problems, headaches, breathing problems). The spit sample that you provide (two samples in the lab and three samples in your home) will help us to understand how stress you may have experienced impacts biological functioning.

It should be understood that there were no "right" or "wrong" answers that could have been provided. The purpose of this research was to get an honest and accurate account of stressful events you have experienced or are currently experiencing. We appreciate the time you have taken to complete these surveys. Thank you for your participation.

If you have any questions about this study or about psychological research in general, do not hesitate to contact Whitney Jeter at wjeter@ksu.edu.

If you have concerns of a more personal nature, you should feel free to contact a local counseling psychologist. If you live in the Manhattan, KS area, feel free to contact University Counseling Services at counsel@ksu.edu or (785-532-6927) or Pawnee Mental Health Services (785-587-4300). You can also contact the Crisis Center located in Manhattan (785-539-2785) or Junction City (785-762-8835) as well as the National Domestic Violence Hotline (1-800- 799-SAFE) or the National Dating Violence Helpline (1-866-331-9474 or www.loveisrespect.org).

If you have any questions about the ethical content of this study, do not hesitate to contact Dr. Rick Scheidt, Chair of Committee Research Involving Human Subjects at 785-532-3224.

**Again, thank you for your time!**

## Appendix C

Please indicate:

1. Your age? _____

Please circle the description that best describes you:

2. Your gender?
   - Female
   - Male

3. Your race/ethnicity?
   - Black/African-American
   - White/Caucasian
   - Hispanic/Latino/a
   - Asian
   - Other  If other, please describe: _____

4. Your classification (by credit hour)?
   - Freshman
   - Sophomore
   - Junior
   - Senior

5. Are you currently in a romantic relationship?
   - Yes
   - No

6. If yes, please indicate how long you have been in this relationship (e.g., 1 year and 3 months)

   _____

7. If no, please indicate how long ago you were in a romantic relationship lasting at least 6 months (e.g., 2 years and 5 months)

   _____

8. How stressed are you this week?
   - Not at all stressed
   - Somewhat stressed
   - Moderately stressed
   - Very stressed

9. Did you take any tests or final exams the week of completing this study?
   - Yes
   - No

## Appendix D

Childhood Trauma Questionnaire (CTQ-SF; Bernstein et al., 2003)

*Directions:* Below is a list of statements that might have occurred during your childhood and adolescence. Please indicate the response that best describes you using the following rating scale. There are no right or wrong answers.

0 Never
1 Rarely
2 Sometimes
3 Often
4 Almost always

1. I was called names by my family
2. I felt hated by my family
3. People in my family said hurtful things to me
4. I was emotionally abused by my family members
5. My parents told me they wished I was never born
6. I was hit hard enough by a family member to see a doctor
7. I was hit hard enough by a family member to leave bruises
8. I was punished by a family member with hard objects
9. I was physically abused by a family member
10. I was hit badly enough by a family member for it to be noticed
11. I felt loved by my family
12. I was made to feel important by my family
13. I was looked out for
14. I felt close with my family
15. My family was a source of strength
16. My family did not give me enough to eat
17. I was taken care of by my family
18. My parents were drunk or high
19. I wore dirty clothes
20. I got taken to the doctor

## Appendix E

Bully Victimization Scale (BVS; Reynolds, 2003)

*Directions:* The following sentences tell about things that have happened in and out of school. Please read each sentence and indicate the number that tells best how often this happened to you when you were in school (e.g., elementary school, middle school, junior high, high school, and college). There are no right or wrong answers.

0 Never
1 Rarely
2 Sometimes
3 Often
4 Almost always

1. Other kids pushed me.
2. Other kids teased me or called me names.
3. One or more kids hit me for no reason.
4. Some kids broke something of mine.
5. Some kids said they would hurt me.
6. I was afraid that other kids would hurt me.
7. Some kids said they would hurt my family.
8. Other kids tried to pick a fight with me.
9. Other kids did things to make me feel bad or get mad.
10. A kid threw something at me to hurt me.
11. I told my parents other kids were picking on me.
12. Some kids took my books or papers.
13. Some kids chased me and tried to hurt me.
14. A group of kids tried to beat me up.
15. Some kids made me do something that got me in trouble.
16. Some kids were mean to me at school.
17. Other kids did things to me that made me feel bad.
18. I ran away from a kid or kids who tried to pick a fight with me.
19. Some kids told me that they would hurt me.
20. Some kids hit or kicked me.
21. Some kids spit on me.
22. I told a teacher that other kids were picking on me.
23. A kid made me do something that I did not want to do.

## Appendix F

Measure of Psychologically Abusive Behaviors (MPAB; Follingstad, 2011)

*Directions*: No matter how well a couple gets along, there are times when they disagree, get annoyed with the other person, want different things from each other, or just have spats or fights because they are in a bad mood, are tired, or for some other reason. Couples also have many different ways of trying to settle their differences. This is a list of things that might happen when you have differences. Please indicate how many times your partner did each of these things during your relationship. If you are not currently in a romantic relationship, please think about your most recent relationship and answer the questions based on that relationship. There are no right or wrong answers.

0 Never
1 Rarely
2 Sometimes
3 Often
4 Almost always

1. My partner harmed or destroyed my personal things of value (e.g., pictures, keepsakes, clothes, etc.) as a way to intimidate me.
2. My partner threatened to harm others (e.g., your family, your children, your close friends) around me to intimidate me.
3. My partner harmed pets as a way to intimidate me.
4. My partner threw a temper tantrum (e.g., breaking objects, acting in a rage) as a way to frighten me.
5. My partner verbally threatened to physically harm me or made a gesture that seemed physically threatening as a way to frighten me.
6. My partner threatened to kill me as a way to frighten me.
7. My partner acted rude toward, gossiped about, or told lies about my family and friends to discourage me from spending time with them?
8. My partner tried to keep me from socializing with family or friends without him/her being present.
9. My partner tried to forbid me from socializing with family or friends?
10. My partner continued to act very upset (e.g., pouted, stayed angry, gave you the silent treatment) until I did what he/she wanted you to do.
11. My partner threatened to end the relationship as a way to get me to do what he/she wanted.
12. My partner threatened to commit suicide as a way to get me to do what he/she wanted
13. My partner threatened to reveal an embarrassing secret as a way to hurt or manipulate me.
14. My partner revealed important secrets to others that I had told him/her as a way to embarrass me.
15. My partner insulted or ridiculed me in front of others
16. My partner criticized and belittled me as a way to make me feel bad about myself.

17. My partner yelled and screamed as a way to intimidate me.
18. My partner called me a derogatory name as a way to make me feel bad about myself
19. My partner tried to make me think he/she was more competent and intelligent than me as a way of making me feel inferior?
20. My partner treated me as useless or stupid as a way to make me feel inferior.
21. My partner tried to demand obedience to orders that he/she gave as a way of establishing his/her authority over me.
22. My partner intentionally turned a neutral interaction into an argument or disagreed with the purpose to create conflict.
23. My partner treated an argument as though he/she had to "drive me into the ground" and make me feel bad when making their points.
24. My partner treated me with strong hatred and contempt.
25. My partner tried to make me report on the details of where I went and what I did when I was not with him/her as a way to check on me.
26. My partner listened in on phone conversations, read my email or went through my belongings without my permission as a way to check on me
27. My partner followed or had me followed by someone else as a way of checking up on my activities?
28. My partner pointed out others as attractive as a way of making me feel uncomfortable.
29. My partner flirted with others in front of me as a way to make me jealous.
30. My partner implied he/she was having an affair as a way to make me feel insecure and worried.
31. My partner acted very upset because he/she felt jealous if I spoke to or looked at any person.
32. My partner falsely accused me of trying to have an affair, or actually having an affair as a way to restrict my behavior as proof I was not.
33. My partner tried to prevent me from speaking to or looking at any person who could be a potential romantic partner for me.
34. My partner ignored important holidays and events as a way to punish or hurt me.
35. My partner refused to speak to me as a way to punish or hurt me.
36. My partner withheld physical or verbal affection as a way to punish or hurt me.
37. My partner acted very upset when he/she didn't get to make small decisions, such as what to watch on television or which restaurant to eat at to control me.
38. My partner tried to make personal choices that should have been left up to me (e.g., which clothes to wear, whether I should smoke or drink, what I ate) to control me.
39. My partner tried to make major decisions that affected me without consulting with me to control me.

## Appendix G

Conflict Tactics Scale - Version 2 (*CTS-2*; Straus et al., 1996)

*Directions*: No matter how well a couple gets along, there are times when they disagree, get annoyed with the other person, want different things from each other, or just have spats or fights because they are in a bad mood, are tired, or for some other reason. Couples also have many different ways of trying to settle their differences. This is a list of things that might happen when you have differences. Please indicate how many times your partner did each of these things during your relationship. If you are not currently in a romantic relationship, please think about your most recent relationship and answer the questions based on that relationship. There are no right or wrong answers.

0 Never
1 Rarely
2 Sometimes
3 Often
4 Almost always

**How often did this happen…**
1. My partner threw something at my partner that could hurt.
2. My partner twisted my partner's arm or hair.
3. My partner pushed or shoved my partner.
4. My partner used a knife or gun on me.
5. My partner punched or hit my partner with something that could hurt.
6. My partner choked my partner.
7. My partner slammed my partner against a wall.
8. My partner beat up my partner.
9. My partner grabbed my partner.
10. My partner slapped my partner.
11. My partner burned or scalded me on purpose.
12. My partner kicked me.

## Appendix H

Tendency to Forgive Scale (TTF; Brown, 2003)

Directions: Below is a list of statements that people sometimes think, feel or act. Please indicate the response that best describes you using the following rating scale. There are no right or wrong answers.

0 Never
1 Rarely
2 Sometimes
3 Often
4 Almost always

1. I tend to get over it quickly when someone hurts my feelings.
2. If someone wrongs me, I often think about it a lot after.
3. I have a tendency to harbor grudges.
4. When people wrong me, my approach is just to forgive and forget.

## Appendix I

Resiliency Scale for Adolescents (Prince-Embury, 2007)

Directions: Below is a list of statements that people sometimes think, feel or act. Please indicate the response that best describes you using the following rating scale. There are no right or wrong answers.

0 Never
1 Rarely
2 Sometimes
3 Often
4 Almost always

1. It is easy for me to get upset.
2. People say that I am easy to upset.
3. I strike back when someone upsets me.
4. I get very upset when things don't go my way.
5. I get very upset when people don't like me.
6. I can get so upset that I can't stand how I feel.
7. I get so upset that I lose control.
8. When I get upset , I don't think clearly
9. When I get upset, I react without thinking.
10. When I get upset, I stay upset for about an hour.
11. When I get upset, I stay upset for several hours.
12. When I get upset, I stay upset for the whole day.
13. When I get upset, I stay upset for several days.
14. When I get upset, I make mistakes
15. When I get upset, I do the wrong thing.
16. When I get upset, I get into trouble.
17. When I get upset, I do things that I later feel bad about.
18. When I get upset, I hurt myself.
19. When I get upset, I hurt someone.
20. When I get upset, I get mixed –up.
21. I can meet new people easily.
22. I can make friends easily.
23. People like me.
24. I feel calm with people.
25. I have a good friend.
26. I like people
27. I spend time with my friends.
28. Other people treat me well.
29. I can trust others.
30. I can let others see my feelings.
31. I can calmly tell others that I don't agree with them.
32. I can make up with friends after a fight.

33. I can forgive my parent(s) if they upset me.
34. If people let me down, I can forgive them.
35. I can depend on people to treat me fairly.
36. I can depend on those closest to me to do the right thing.
37. I can calmly tell a friend if he or she does something that hurts me.
38. If something bad happens, I can ask my friends for help.
39. If something bad happens, I can ask my parent(s) for help.
40. There are people who will help me if something bad happens.
41. If I get upset or angry, there is someone I can talk to.
42. There are people who love and care about me.
43. People know who I really am.
44. People accept me for who I really am.
45. Life is fair.
46. I can make good things happen
47. I get the things I need
48. I can control what happens to me
49. I do things well.
50. I am good at fixing things
51. I am good at figuring things out.
52. I make good decisions.
53. I can adjust when plans change.
54. I can get past problems in my way.
55. If I have a problem, I can solve it.
56. If I try hard, it makes a difference
57. If at first I don't succeed, I will keep on trying.
58. I can think of more than one way to solve a problem.
59. I can learn from my mistakes.
60. I can ask people for help when I need to.
61. I can let others help me when I need to.
62. Good things will happen to me.
63. My life will be happy.
64. No matter what happens, things will be alright.

## Appendix J

Trauma Symptom Checklist (*TSC-40*; Briere, & Runtz, 1989)

*Directions:* Please indicate how often have you experienced each of the following in the last two months? There are no right or wrong answers.

0 Never
1 Seldom
2 Sometimes
3 Often
4 Almost Always

1. Headaches in the last two months
2. Insomnia (trouble getting to sleep)
3. Weight loss (without dieting)
4. Stomach problems
5. Feeling isolated from others
6. "Flashbacks" (sudden, vivid, distracting memories)
7. Restless sleep
8. Anxiety attacks
9. Loneliness
10. Nightmares
11. "Spacing out" (going away in your mind)
12. Sadness
13. Dizziness
14. Trouble controlling your temper
15. Waking up early in the morning and can't get back to sleep
16. Uncontrollable crying
17. Fear of men
18. Not feeling rested in the morning
19. Trouble getting along with others
20. Memory problems
21. Desire to physically hurt yourself
22. Fear of women
23. Waking up in the middle of the night
24. Passing out
25. Feeling that things are "unreal"
26. Unnecessary or over-frequent washing
27. Feelings of inferiority
28. Feeling tense all the time
29. Desire to physically hurt others
30. Feelings of guilt
31. Feelings that you are not always in your body
32. Having trouble breathing

## Appendix K

Spit Instructions

**3 spit samples should be provided by you in your home during the following times:**

1. 8-9pm
2. Upon waking between 8-9am
3. 30 minutes after waking

**In order to avoid the possibility of contaminating the spit sample you provide, we strongly recommend the following precautions:**

• Avoid alcohol for 12 hours before sample collection.
• Do not eat a major meal within 60 minutes of sample collection.
• Avoid dairy products for 20 minutes before sample collection.
• Avoid foods with high sugar or acidity, or high caffeine content, immediately before sample collection.
• Rinse mouth with water to remove food residue before sample collection. Wait at least 10 minutes after rinsing before collecting saliva to avoid sample dilution.
• Do not brush your teeth within 45 minutes prior to sample collection.

**Instructions for providing a spit sample:**

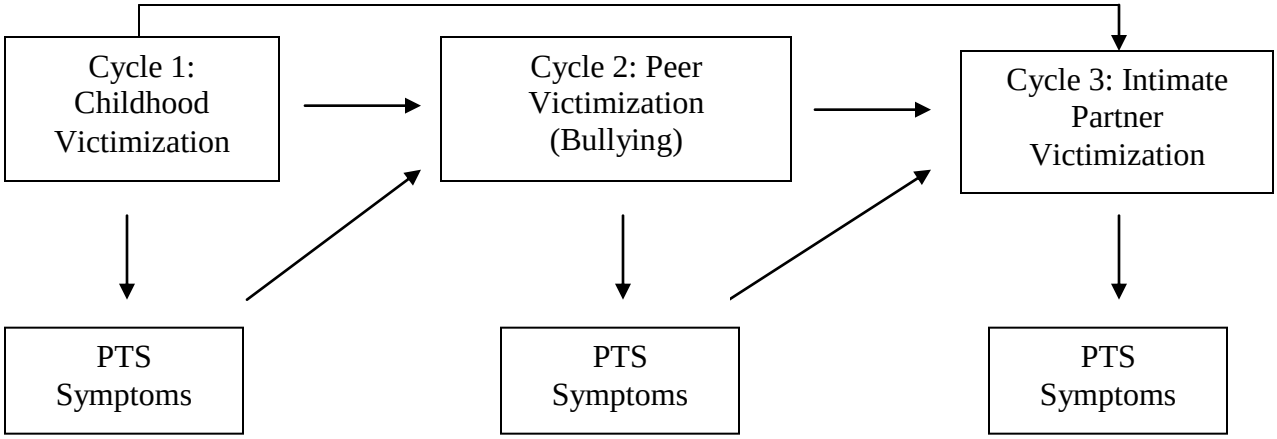
1. Remove the oral swab from its packaging and place into proper mouth location under the front of your tongue.
2. Keep the oral swab in place for 3 minutes to insure that it is saturated.
3. Place the oral swab into the labeled swab storage tube insert
   - The swab taken between 8-9pm should be placed in the tube labeled (8-9pm)
   - The swab taken after waking (between 8-9am) should be placed in the tube labeled (8-9am)
   - The swab taken 30 minutes after waking should be placed in the tube labeled (30 minutes)
4. Replace cap and snap securely onto tube.

**Instructions for storing the spit samples:**

1. Place the storage tube containing your sample inside your freezer as soon as possible after collection.

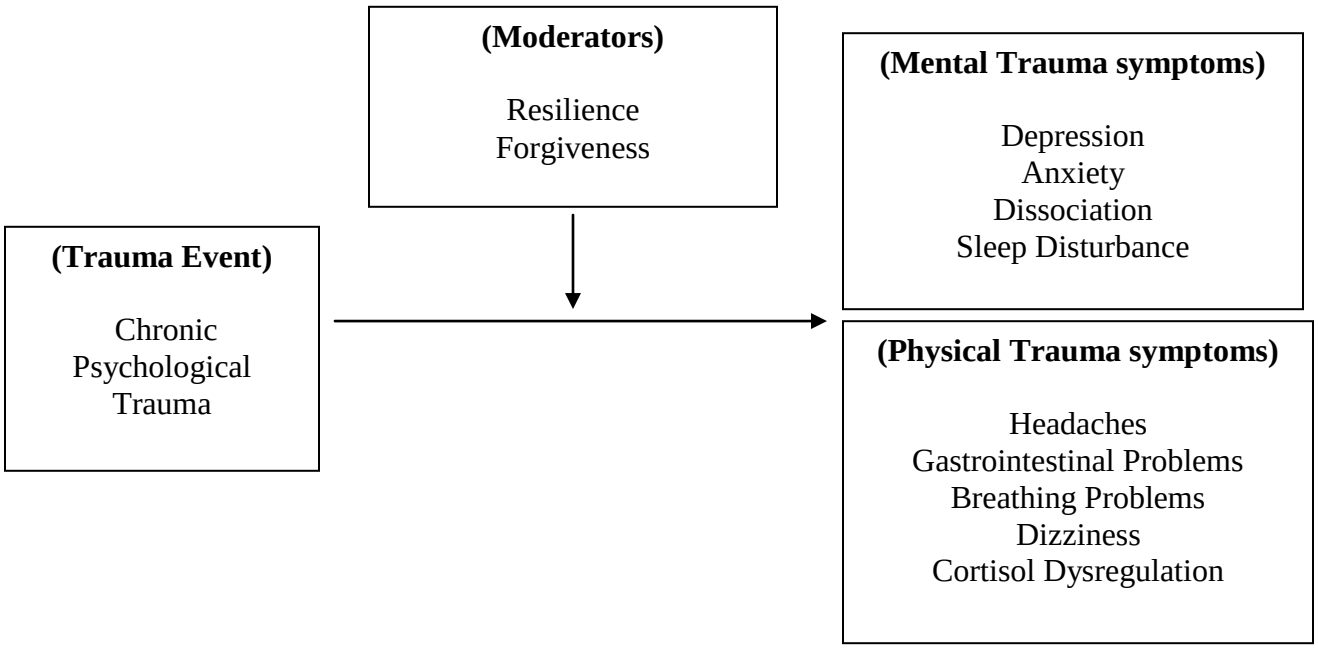
*****Please be sure to return the sample to Dr. McDaniel's lab at 12pm the day following completion of the surveys.**

Figure 1.




*Note:* PTS stands for Posttraumatic Stress

Figure 2.




*Note:* Words in bold denote variable names used in the Etiology of Psychopathology Model. Words not in bold denote variables used within the current study placed within the context of bridging the Chronic Relational Trauma Model and Etiology of Psychopathology Model.

Figure 3.

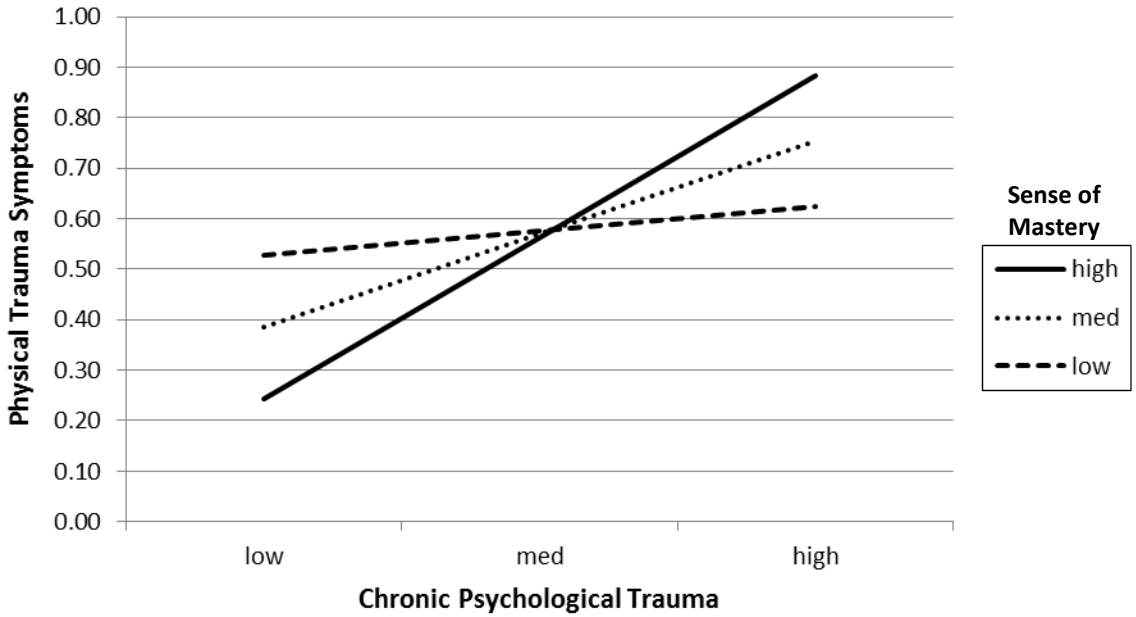

1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
Physical Trauma Symptoms
low
med
high
Chronic Psychological Trauma
Sense of Mastery
high
med
low

Figure 4.

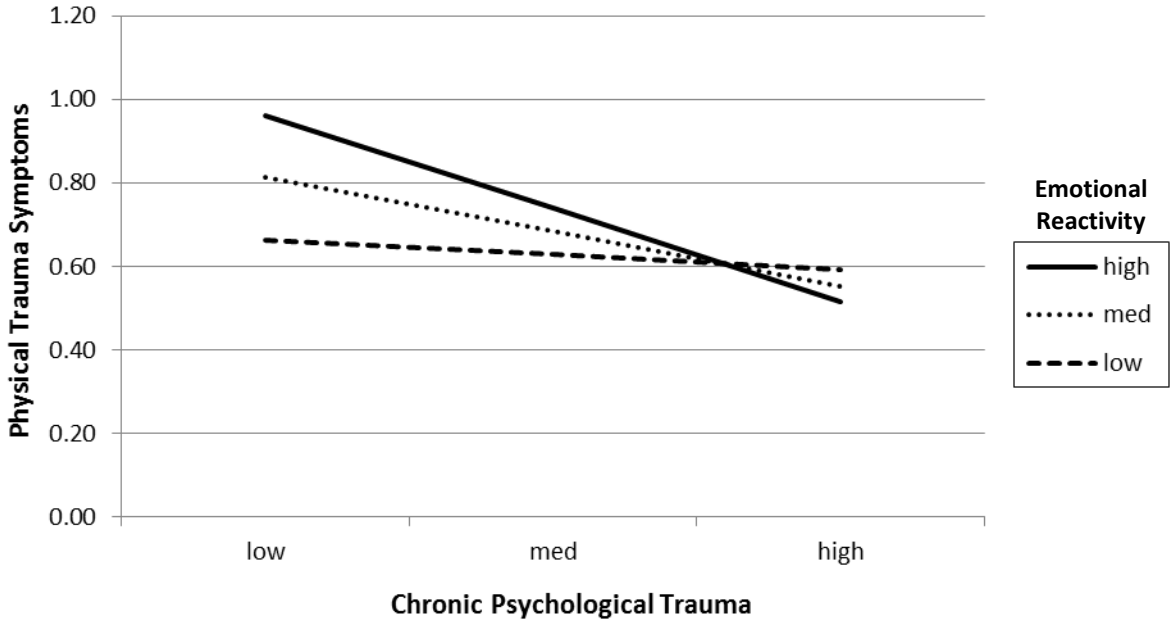

1.20
1.00
0.80
0.60
0.40
0.20
0.00
Physical Trauma Symptoms
low
med
high
Chronic Psychological Trauma
Emotional Reactivity
high
med
low

Figure 5.

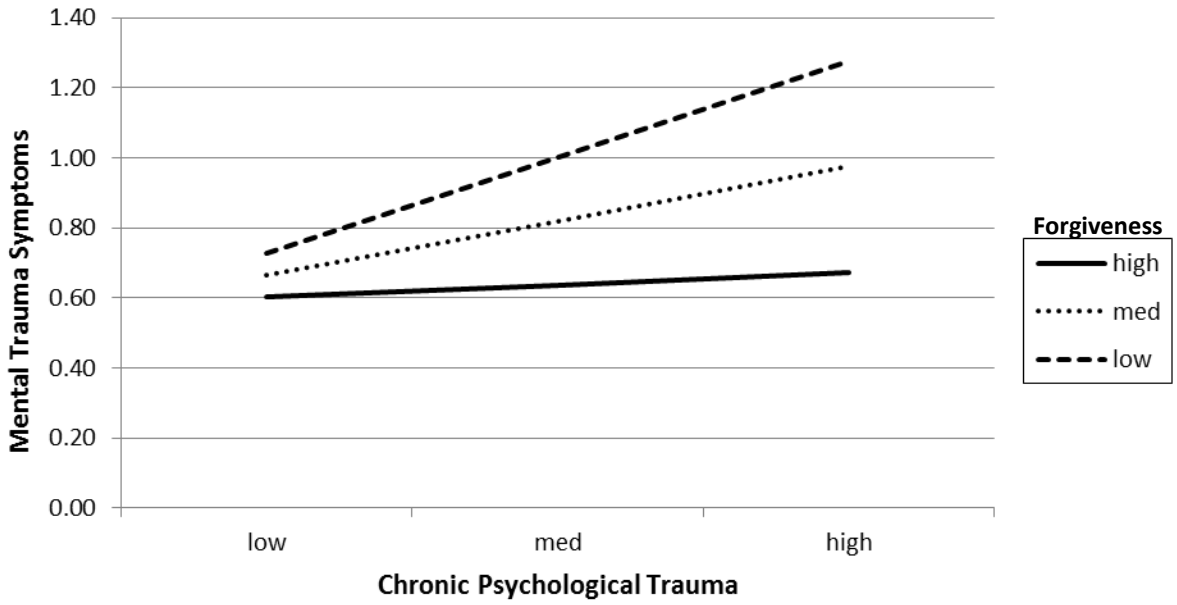
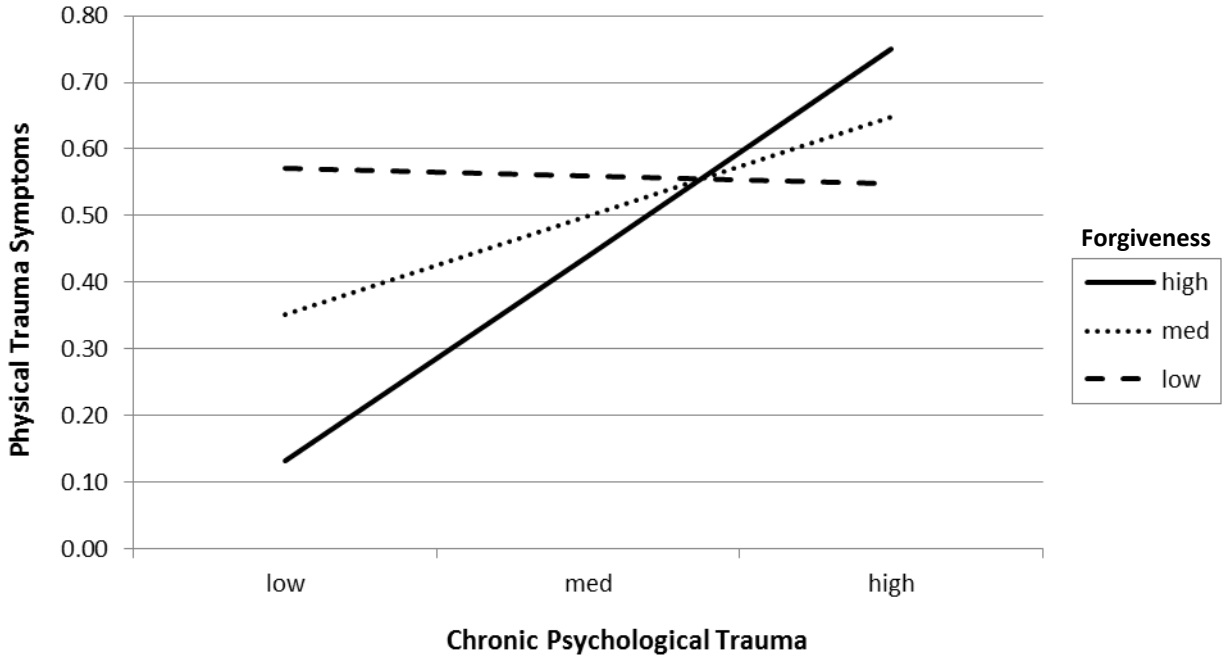

1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
Mental Trauma Symptoms
low
med
high
Chronic Psychological Trauma
Forgiveness
high
med
low

Figure 6.


0.80
0.70
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0.50
0.40
0.30
0.20
0.10
0.00
Physical Trauma Symptoms
low
med
high
Chronic Psychological Trauma
Forgiveness
high
med
low

Table 1

*Means and Standard Deviations for Females and Males reporting Chronic Psychological Trauma, Mental and Physical Trauma Symptoms, and Cortisol Levels (12pm)*

| | Total ($n$ = 180) | | Females ($n$ = 119) | | Males ($n$ = 61) | |
|---|---|---|---|---|---|---|
| Variable | Mean | *SD* | Mean | *SD* | Mean | *SD* |
| Psychological Trauma | .51 | .43 | .51 | .42 | .49 | .45 |
| Mental Trauma symptoms | .87 | .60 | .95 | .61 | .71 | .53 |
| Physical Trauma symptoms | .92 | .64 | 1.10 | .65 | .62 | .51 |
| Cortisol Levels (12pm) | -.30 | .29 | -.29 | .29 | -.33 | .30 |

Table 2

*Chronic Psychological Trauma Differentially Predicts Mental Trauma Symptoms, Physical Trauma Symptoms, and Cortisol Levels (12pm) for Females and Males*

| | Females ($n$ = 119) | | | Males ($n$ = 61) | | |
|---|---|---|---|---|---|---|
| Mental Trauma Symptoms | $F$ | β | $\Delta R^2$ | $F$ | β | $\Delta R^2$ |
| Step 1: | | | | | | |
| Chronic Physical Trauma | 36.00 | .49*** | .24 | 49.39 | .68*** | .46 |
| Step 2: | | | | | | |
| Chronic Psychological Trauma | 26.22 | .43*** | .08 | 28.17 | .38* | .04 |

| | Females ($n$ = 119) | | | Males ($n$ = 61) | | |
|---|---|---|---|---|---|---|
| Physical Trauma Symptoms | $F$ | β | $\Delta R^2$ | $F$ | β | $\Delta R^2$ |
| Step 1: | | | | | | |
| Chronic Physical Trauma | 21.90 | .40*** | .16 | 15.21 | .45*** | .21 |
| Step 2: | | | | | | |
| Chronic Psychological Trauma | 11.73 | .16 | .01 | 8.71 | .31 | .03 |

| | Females ($n$ = 115) | | | Males ($n$ = 60) | | |
|---|---|---|---|---|---|---|
| Cortisol Levels (12pm) | $F$ | β | $\Delta R^2$ | $F$ | β | $\Delta R^2$ |
| Step 1: | | | | | | |
| Chronic Physical Trauma | .65 | .08 | .01 | .55 | -.10 | .01 |
| Step 2: | | | | | | |
| Chronic Psychological Trauma | .77 | -.14 | .01 | 1.04 | .32 | .03 |

*Note:* Degrees of Freedom for mental and physical trauma symptoms for females (2, 116) and males (2, 58). Degrees of Freedom for cortisol levels for females (2, 112) and males (2, 57).
$p$ <.05*, $p$ <.01**, $p$ < .001***