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Examining the Relations Among Trauma, Distress, Resilience, and Physical Health

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Abstract

This study examined the role of traumatic distress as a mediator in the relation between trauma exposure and somatic malaise and healthcare utilization. Resilience was examined as a moderator between trauma exposure and somatic malaise and healthcare utilization, then between trauma exposure and traumatic distress. A total of 206 female participants recruited from an obstetrics and gynecology specialty practice completed measures of trauma exposure, traumatic distress, resilience, somatic malaise, and healthcare utilization. Multiple hierarchical regressions were performed to test the hypothesized relations. Results indicated that trauma exposure was a significant predictor of traumatic distress and resilience, and of somatic malaise but not of healthcare utilization. Traumatic distress partially mediated the relation between trauma exposure and somatic malaise. Resilience did not moderate the relation between trauma exposure and somatic malaise or exposure and traumatic distress, but alone significantly predicted each variable and interacted with trauma exposure to account for more variance in the prediction of healthcare utilization. Results confirm trauma exposure as the most significant predictor of health outcomes, though even subclinical traumatic distress mediates the impact of trauma itself. Resilience appears to positively impact coping with psychological and physical distress, yet does not reduce the effects of trauma exposure itself. Implications of findings and future directions are discussed.

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Introduction

There has recently been a surge of interest in the relation between traumatic or adverse life experiences and subsequent development of chronic physical health problems. Groundbreaking research in the fields of internal medicine and epidemiology has begun to illustrate the strong associations between a wide range of adult physical health problems and prior experience of traumatic or other adverse events in childhood and across the lifespan (Felitti et al., 1998; Kendall-Tackett & Klest, 2008; Martin et al., 2000; 2008; Pennebaker, Kiecolt-Glaser, & Glaser, 1988; Schnurr & Green, 2004; Wuest et al., 2008). These studies have consistently revealed that exposure to trauma and adversity, especially during childhood, significantly increases the risk for development of a variety of chronic health problems including cardiovascular disease, cancer, diabetes, multiple sclerosis, and a wide range of autoimmune and functional pain disorders (Felitti & Anda, 2009; Kendall-Tackett, 2009; Spitzer et al., 2012; Woods et al., 2005; Wuest et al., 2008),

Other recent studies have investigated the mechanisms through which trauma potentiates the development of long-term physical health problems, focusing primarily on Post Traumatic Stress Disorder (PTSD)-related symptomology as it has a significant potential to increase the amount of emotional and physiological stress on an individual's defense system. Although some studies have shown that PTSD may act minimally as a partial mediator in the relation between trauma and physical health problems (Gill, Saligan, Woods, & Page, 2009; Pietrzak, Goldstein, Southwick, & Grant, 2012; Qureshi, Pyne, Magruder, Schulz, & Kunik, 2009; Schnurr & Green, 2004; Sledjeski, Speisman, & Dierker, 2008), other studies investigating the same phenomenon have suggested that multiple exposures to trauma (recently defined as poly-victimization), may

contribute more variance than PTSD symptoms to long-term mental and physical health (Elliott, Alexander, Pierce, Aspelmeier, & Richmond, 2009; Finkelhor, Ormrod & Turner, 2009; Hickman et al., 2013; Qureshi et al., 2009).

In addition, there have been a multitude of studies showing that individuals exhibit a range of symptomatic responses following trauma, ranging from meeting full diagnostic criteria for PTSD to subclinical levels of distress, depression, to resilient recovery with little or no experience of subjective distress (Bonanno, Westphal, & Mancini, 2010; Briere & Jordan, 2009; Connor, Davidson, & Lee, 2003; Ehlers & Clark, 2000; Foa, Riggs, & Gershuny, 1995; Kendall-Tackett & Klest, 2008; Roth, Newman, Pelcovitz, van der Kolk, & Mandel, 1997). However, very few studies have investigated the role of subclinical posttraumatic stress in potentiating health problems (Briere & Jordan, 2009; Gansill, Edwards, Kearns, Gidycz, & Calhoun, 2012; Goldsmith, Freyd, & DePrince, 2012; Matheson, Jorden, & Anisman, 2008; Smith et al., 2008). While not all responses to trauma meet criteria for diagnosis of PTSD, even resilient individuals may experience some level of trauma-related distress that may have a deleterious effect on overall physical functioning (Bonanno et al., 2010; Connor & Davidson, 2003; Mancini et al., White, 2009). Despite a recent focus on the construct of resilience as a potentially significant variable affecting response to trauma, very little research has been done to explore the role of resilience as a variable affecting long-term physical functioning after trauma (Anderson & Anderson, 2003; Connor & Davidson, 2003; Yi, Vitaliano, Smith, Yi , & Weinger, 2008; Nygren et al., 2005). This project aims to further examine the effects of a range of trauma-related symptoms, including subclinical levels of PTSD, in predicting long-term physical health outcomes following trauma, as well as attempt to elucidate the role of resilient functioning in predicting long-term physical health.

Traumatic experiences have been part of human existence from the beginning of historical record. Statistics from the National Center for PTSD and National Comorbidity Study estimate that approximately 60% of men and 50% of women have experienced at least one traumatic event in their lifetime (Jankowski, 2003; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). Other studies have shown that the majority of those reporting trauma have experienced more than one traumatic event in their lifetime, suggesting that multiple traumatization may be as pervasive in today's society as discrete trauma events (Felitti & Anda, 2009; Felitti et al., 1998; Kendall-Tackett, 2009). This realization has far-reaching effects in terms of how we understand the impact of trauma on psychological, physical, and overall well-being.

The effects of traumatic exposure have long held the interest of clinical researchers, practitioners, and the general public, a trend that has been reflected in the groundbreaking research of trauma and PTSD) over the past 30 years (Ehlers & Clark, 2000; Foa, Zinbarg, & Rothbaum, 1992; Herman, 1997; McNally, 2003). Much has been learned about the effect of trauma on psychological health, from its impact on emotional and cognitive functioning to neurological changes that affect biological and behavioral processes (Briere & Scott, 2006; Ehlers & Clark, 2000; Kendall-Tackett & Klest, 2008). Researchers have noted the effect these inherent stressors likely have on the immune systems and the overall physical health of those who have suffered traumatic experiences (Kendall-Tackett & Klest, 2008; Kendall-Tackett, 2009; Schnurr & Green, 2004).

While there is growing interest in the topic, relatively little research has investigated the specific nature of the relation between trauma and physical health. Some recent studies have pointed to the "silent impact" of traumatic experience on aspects of physical health (Felitti &

Anda, 2009; Kendall-Tackett & Klest, 2008; Martin et al., 2008; Schnurr & Green, 2004), and have led to further questioning about the mechanisms through which trauma affects one's physical health. Not only does trauma appear to have a significantly deleterious effect on immune functioning and overall sense of well-being, it seems that trauma may negatively impact multiple systems of physical functioning, including cardiovascular, digestive, reproductive, and respiratory health (Campbell, 2002; Kendall-Tackett & Klest, 2008; Leserman & Drossman, 2007; Schnurr & Green, 2004). Although a physician may not see the impact of traumatic experience on physical functioning directly or even immediately, it seems that trauma may work across time to slowly wear down the ability of the individuals to maintain healthy functioning due to the chronic stressful nature of trauma and PTSD (Felitti et al., 1998; Kendall-Tackett, 2009; Schnurr & Green, 2004).

It is important to note that distress that fails to meet clinical criteria for a diagnosis of PTSD does not necessarily indicate the absence of psychological distress symptoms, but may instead reflect a subclinical level of distress (Bonanno, Galea, Bucciarelli, & Vlahov, 2006; Briere & Jordan, 2004; 2009; Browne & Winkelman, 2007; White, 2009). There is a significant amount of research that shows PTSD develops in only a small percentage of those who have been exposed to traumatic events (APA, 2000; Bonanno, 2004; Connor et al., 2003; McNally, 2003). However, studies have shown that trauma survivors may still report distress, though it might not meet DSM criteria for PTSD (Bonanno et al., 2010; Briere & Jordan, 2009; Roth et al., 1997; Stessman et al., 2008; White, 2009). In fact, a recent study examining the relation between trauma, resilience, and distress found that participants who ranked themselves high on factors of resilience also endorsed numerous symptoms of traumatic distress (White, 2009). These findings suggest that there may be a wide spectrum of reactions to traumatic exposure, not

all of which meet diagnostic criteria for a diagnosis of PTSD, but still reflect the stress induced by exposure to a traumatic event. Therefore, it is essential to better understand the relation between traumatic exposure and physical health outcomes by empirically examining the impact of variable psychological responses following trauma exposure that may not meet full criteria for a diagnosis of PTSD.

Recent trauma research has included an investigation into the phenomenon of resilience, defined broadly as the ability to achieve or maintain positive and adaptive level of functioning in spite of extreme stressors, such as developmental or environmental adversity, traumas, or other negative life events (Bonanno et al., 2010; Connor & Davidson, 2003; Lepore & Revenson, 2006; Luthar & Zigler, 1991; Rutter, 1993). Historically, the large majority of research on the construct of resilience has focused on factors that allow a person to achieve or maintain positive mental health (Bonanno et al., 2002; Richardson, 2002; Rutter, 1985; White 2009), consistent with clinical and anecdotal assumptions that life's adversities primarily create a significant psychological strain rather than imposing a significant threat to one's physical well-being (Kendall-Tackett, 2009; Schnurr & Green, 2004). As such, relatively little investigation has occurred into the question of how resilience affects physical functioning. There are certainly indicators that suggest factors of resilience provide a buffer against the development of stress related health problems (Anderson & Anderson, 2003; Taft, Stern, King, & King, 1999; Tremblay, Blanchard, & Pelletier, 2006). Previous studies have approached the question of resilience and physical health with the assumption that resilience prevents trauma-related health problems, but more research is needed to better understand how resilience affects physical health to confirm these hypotheses. As previous studies have noted that resilient individuals do not experience an absence of distress symptoms (Bonanno et al., 2010; DeRoon-Cassini, Mancini,

Rusch, & Bonanno, 2010; Connor et al., 2003; White, 2009), it is important to consider how subclinical levels of symptoms following trauma impact physical health.

Impact of Trauma on Physical Health

Recently, trauma researchers have begun to turn their attention to questions surrounding the impact of traumatic experiences over time, particularly in terms of its impact on overall physical health and longevity (Chaudieu et al., 2011; Felitti & Anda, 2009; Gill et al., 2009; Kendall-Tackett, 2009; Kendall-Tackett & Klest, 2008; Schnurr & Green, 2004). Researchers from the fields of health psychology, medicine, nursing, epidemiology, and public health have all found that traumatic events increase the risk for health problems (Felitti & Anda, 2009; Kendall - Tackett & Klest, 2009; Martin et al., 2008). Within the field of medicine, research in the areas of gynecology, gastroenterology, and rheumatology has found significant connections between reports of pain and histories of childhood and/or domestic abuse (Campbell & Lewandoski, 1997; Kendall-Tackett & Klest, 2009; Leserman & Drossman, 2007; Spitzer et al., 2012). Results from large-scale epidemiological studies such as the Adverse Childhood Experiences Study (Felitti et al., 1998; Felitti & Anda, 2009; Kendall-Tackett & Klest, 2008) also revealed that those who experienced more adverse events in childhood have more severe health problems and are at a higher risk for disease. These findings are especially significant, as there may be an unfortunate tendency for physicians to dismiss reports of non-specific chronic pain (e.g., pelvic pain, irritable bowel syndrome, fibromyalgia) as functional, rather than organic, disorders (Campbell, 2002; Hien, Litt, Cohen, Miele, & Campbell, 2009; Kendall-Tackett & Klest, 2008; Leserman & Drossman, 2007; Spitzer et al., 2012).

In their groundbreaking research, Felitti et al. (1998) found that those who had experienced adverse or traumatic experiences in childhood were at an exponentially higher risk

of developing medical disease, psychiatric disorders, and sexual behavior problems in adulthood. They surveyed 13, 494 middle-class adults who had completed a standard medical visit through their HMO Kaiser-Permanente, and found that over half (52%) of the participants reported at least one adverse childhood event (ACE) (see Appendix A for list of questions, included in this study). The questions were grouped into abuse and household dysfunctions, categorized by psychological, physical, and sexual abuse; and substance abuse, mental illness, domestic abuse, and criminal behavior associated with household dysfunction. Only one-third of the population had an ACE score of 0. Felitti et al. (1998) found that if any one category was experienced, individuals were 87% more likely to experience at least one more event in other categories. One in six participants reported four or more adverse childhood events, and one in nine endorsed five or more ACE items. Interestingly, women were 50% more likely to experience five or more adverse experiences in childhood compared to men (Felitti & Anda, 2009).

Beyond the staggering data reflecting the prevalence of childhood trauma and adversity in adult populations, the ACE study (Felitti et al., 1998) revealed startling trends in the link between childhood adversity and adult physical health problems. Those who had experienced four or more childhood events were 4 to 12 times more at risk for alcoholism, drug abuse, depression, and suicide attempts than those who reported no events. Individuals with an ACE score of four or more were 2 to 4 times more likely to smoke tobacco, have poor-self rated health, over 50 sexual partners, and have sexually transmitted disease (Felitti et al., 1998). Highlighting these results were findings that the number of childhood events had a strong graded relationship to the presence of adult physical health problems, with more incidence of adversity associated with significantly more incidence of disease.

Emerging research has begun to discuss the phenomenon of repeated trauma exposure as "polyvictimization," characterizing the incidence of multiple traumatic events as cumulative and building in their potential for negative impact with each additional experience (Elliott et al., 2009; Hickman et al., 2013). Further, empirical evidence has shown that polyvictimization (i.e., exposure to multiple trauma types) contributes more variance to psychological distress and subsequent adjustment than exposure to any one type of trauma alone. Polyvictimization was also found to contribute more variance to the prediction of distress and adjustment than controlled demographic factors such as age, socioeconomic status (SES), ethnicity, and education (Elliott et al., 2009; Hickman et al., 2013). The recent findings regarding the impact of polyvictimization complement the findings of the original ACE study that show the cumulative effect of traumatization on long-term physical health outcomes. Additional research is needed to determine the pathways in which polyvictimization may affect physical health outcomes.

The landscape of the field of traumatology has historically evolved its focus from initial interest in the effects of specific, single trauma types and abuses, to a broad focus on the effects of child maltreatment and associated negative life events, and current interest in the effects of polyvictimization. However, a compilation of research from each subarea within the broad field of traumatology has resulted in investigations examining the effects of a specific type of trauma events not being well-integrated with conclusions of those exploring broader categories of maltreatment and adversity. In order to approach a better understanding of the relation between trauma and long-term outcomes, it is essential to consider the effects of multiple environmental adversities that may account for more explanation of outcomes over time, above and beyond that

explained by chronicity, severity, and nature of trauma itself (Finkelhor, 2012; Hanby, 2012; Hickman et al., 2013).

For example, many researchers within the maltreatment area within the trauma literature initially focused primarily on one form of maltreatment (e.g. child physical abuse, child sexual abuse, child psychological abuse, neglect, sexual assault, witnessing violence/injury, domestic violence) in examining the sequelae of such traumatization (Briere, 1992; McNally, 2003; Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993). In what has been termed the "silo effect" (Hickman et al., 2013; Hanby, 2012), researchers who were investigating the impact of a specific form of interpersonal violence failed to assess either the presence or impact of associated adversities and other traumatic experiences which occurred in the context of specific maltreatment experience as confounding the primary impact of the original trauma itself. As a result, contextual data (e.g. environmental adversity and chaos, emotional abuse, neglect) that may explain additional variance in outcomes following certain trauma types (e.g sexual/physical abuse, domestic violence) were not taken into consideration. Consequently, conclusions may inaccurately attribute outcomes to that specific assessed maltreatment rather than the effects of accumulated associated adversities and broadly negative life events (Edwards, Holden, Felitti, & Anda, 2003; Kracke, 2011; Finkelhor, 2012).

However, recent work of leading researchers in the field of child maltreatment has highlighted the additive effect of different types of trauma and additional associated adversities and/or family dysfunction in their impact on long-term psychological and physical functioning (Elliott et al., 2009; Felitti & Anda, 2009; Finkelhor et al., 2009; Hickman et al., 2013). Some studies have also found the effects of chaotic, emotionally abuse, neglectful familial

environments as "the real culprit" in outcomes following certain traumas such as sexual abuse, describing the nature of these family environments as a "continuous undercurrent" of adversity and maltreatment accompanying the abuse itself (Edwards et al., 2003; Finkelhor, 2012). Recent data indicate that it is accumulation of effects from multiple types of trauma, adversity, and maltreatment, rather than severity, chronicity, or repeated nature of any form of maltreatment or other form of trauma, that predicts symptomatic outcome over time (Briggs-King, 2012; Edwards et al., 2003; Elliott et al., 2009; Finkelhor et al., 2009; Hanby, 2012; Hickman et al., 2013;).

While there is clearly a link between traumatic events and/or adversity and physical health outcomes, it is important to understand the pathways through which traumatic experiences impact physical disease later in life. Felitti and Anda (2009) reviewed two main pathways through which negative life experiences transmute into organic medical disease, pointing out that the most common health risks are poor coping behaviors, such as smoking, alcohol abuse, drug abuse, obesity, and high-level promiscuity. While these negative coping behaviors are not symptoms in themselves, they may be indicators of efforts to reduce the experience of psychological distress following trauma. They also emphasized the negative effects of chronic distress on increased cortisol levels, immune stress responding and pro-inflammatory cytokines, often leading to autoimmune disorder and disease. However, even when controlling for risk factors such as smoking and hypercholesterolemia, along with potentially confounding effects of age, sex, race, and education, one's ACE score continued to have a strong relationship with the presence of coronary disease (Felitti et al., 1998; Felitti & Anda, 2009). The results of this large-scale study led the authors and others to emphasize the consideration of childhood abuse/adversity as a public health problem, particularly given the high prevalence of childhood

polyvictimization and potential for negative health outcomes (Felitti & Anda, 2009). Consideration of developmental adversity may provide a new perspective on the etiology of ill-defined health problems, such as fibromyalgia, obesity, irritable bowel syndrome, and chronic pain, all of which are more likely to present in women (Felitti & Anda, 2009). These results have strong implications for the medical and mental health care of women, in particular, where presentations of distress may be very complex, both physically and psychologically.

The ACE study serves as a foundation upon which subsequent empirical investigations of the relation between trauma and physical health have built, as it was one of the first to statistically describe the significant associations between a wide range of childhood adversity and chronic health conditions (Kendall-Tackett, 2009). It should also be noted that a significant number of items on the ACE score calculator concern childhood abuse and the experience or witnessing of other interpersonal traumas, highlighting the authors' appreciation for both the prevalence and negative impact of such experiences. The abundance of data indicating strong relations between histories of various abuse and violence and subsequent medical health problems suggests an important link between interpersonal trauma and negative long-term physical health (Martin et al., 2008; Campbell & Lewandoski, 1997; Campbell, Martin, Moracco, Manganello, & Macy, 2006; Eadie, Runtz, & Spencer-Rodgers, 2008; Goldsmith, Freyd, & DePrince, 2009; Iverson et al., 2011).

Although early studies established the significant associations between trauma and negative physical health outcomes in community and primary care samples (Felitti et al., 1998; Taft et al., 1999; Kendall-Tackett & Klest, 2008; Schnurr & Green, 2004), a large portion of the literature on the physical health effects of interpersonal trauma has focused on the impact on

women and children. In an early review, Campbell and Lewandoski (1997) found that women abused in childhood and as adults were more likely to report fair to poor health, sexually transmitted diseases, and other gynecological problems such as pelvic inflammatory disease, bladder infections, pelvic pain, unintended pregnancy, increased rate of miscarriage, low birth weight pregnancy, unexplained bleeding and dysmenorrhea, and sexual dysfunction (Campbell & Lewandoski, 1997).

In a subsequent review, Campbell (2002) surveyed population-based studies of mental and physical health outcomes following childhood and adult interpersonal trauma from 1985 – 1998, finding many of the associated physical health symptoms as had been previously reported. In addition to an increase in gynecological symptoms and chronic pain, interpersonal trauma was also associated with increased gastrointestinal problems and self-reported cardiac symptoms like chest pain and high blood pressure (Campbell, 2002). It is important to note, however, that gynecological symptoms such as chronic pelvic pain, sexual dysfunctions, bladder problems, and unexplained vaginal bleeding and infection were found to be the most consistent, longest lasting, and largest health problem difference treating those who have experienced interpersonal trauma from those who have not (Campbell, 2002).

Woods et al. (2008) investigated the effect of interpersonal trauma on the immune status of a sample of women abused in adult relationships versus non-abused women, finding that abused women had a significantly higher white blood cell count, indicating decreased immune status. Women physically abused in adulthood were also found to have experienced significantly more childhood maltreatment and interpersonal trauma than non-abused women (Woods et al., 2008), and were noted to have higher rates of PTSD symptomology. Through regression and

structural equation modeling (SEM), the authors worked to uncover relations between these factors, finding that childhood maltreatment, adult interpersonal trauma, PTSD, and smoking were all found to predict immune status in abused women (Woods et al., 2008). These results provide important insights into the link between trauma and physical health outcomes.

Martin, Rosen, Durand, Knudson, and Stretch (2000) surveyed 555 male and 573 female soldiers on lifetime history of trauma to determine the psychological and physical health effects of sexual assaults and nonsexual traumas. They asked about 14 potentially traumatic events, including sexual assaults, interpersonal traumas, terrifying events occurring to others, and secondary traumatization from hearing of or witnessing a trauma, and found that most soldiers had experienced multiple traumas, most of which occurred prior to military service (Martin et al., 2000). The results from this study support overall findings of higher rates of psychological and physical distress in traumatized women, and in those who have experienced interpersonal trauma. In this study, women reported more psychological distress and more physical health complaints than men. Women also reported higher percentages of lifetime exposure to both interpersonal and non-interpersonal trauma than men. While both men and women reported high incidence of multiple traumatization, women reported significantly more sexual traumas, and men reported significantly more nonsexual events. Overall, the results showed that the number of personal sexual assaults and nonsexual traumas, such as physical assault, serious accidents, and natural disasters, was related to long-term physical health.

Martin et al. (2008) subsequently investigated a representative sample of nearly 1,000 women surveyed by the North Carolina Behavioral Risk Factor Surveillance System (BRFSS), finding that 25% of the women had experienced interpersonal trauma as adults. They found that

women who experienced physical or sexual trauma were much more likely to report poor physical health, as well as poor mental health, than those who had not (Martin et al., 2008). These women also reported significantly more functional impairment, such that "poor physical or mental health kept [them] from doing [their] usual activities, such as self-care, work, or recreation" (p. 132, Martin et al., 2008). Negative health outcomes were significantly more prevalent in those women who experienced both physical and sexual trauma (Martin et al., 2008). The authors stated that physical and sexual abuse has a "radiating impact" (p. 137) on the physical health of women and their subsequent ability to function in their daily lives. These results provide additional support for the premise that multiple interpersonal trauma experiences significantly increases the risk for development of long-term physical health problems than the potential effects of single trauma experience.

Impact of Trauma on Psychological Health

Distress following trauma does not necessarily need to meet criteria for a clinical disorder to disrupt psychosocial functioning and present a risk for the development of long-term physical health problems (Bonanno, 2004; Briere & Jordan, 2004; Luxenberg, Spinnazola & van der Kolk, 2001a; 2001b; White, 2009). Given the high prevalence of trauma exposure in the general population, one may assume that there are large numbers of individuals suffering from significant trauma-related distress, including PTSD. However, while many people in the general population are exposed to serious traumatic events, only a small percentage meet criteria for PTSD as diagnosed by DSM-IV (APA, 2000; Bonanno et al., 2010; McNally, 2003). Some will show impairment in areas of mood or anxiety, interpersonal functioning, or self-esteem, while others may report no significant impairment in any area of functioning (Bonanno et al., 2010;

Briere & Scott, 2006; Luxenberg et al., 2001; White, 2009). Despite the wide range of reactions following traumatic exposure across trauma types and populations, there seems to be a consensus among trauma researchers that traumatic stress has the potential to overwhelm one's ability to restore equilibrium following traumatic life events (APA, 2000; Brewin, Andrews, & Valentine, 2000; Briere, 1992; Ehlers & Clark, 2000; van der Kolk, Roth, Pelcovitz, Sunday, & Spinnazola, 2005). There is also growing recognition that there is a range of responses to traumatic life events, from the most severe disruption being psychological distress consistent with a diagnosis of PTSD, to resilience to the negative effects of trauma exposure with little or no symptomatic distress having little disruption on an individual's overall functional adaptation.

PTSD. The phenomenon of post-traumatic stress disorder (PTSD) is a relatively new diagnosis, appearing for the first time in the third edition of the DSM (APA, 1980). It has since garnered a great deal of attention, both in the field of research as well as in the media and popular culture. In the most current edition of the DSM (APA, 2000), PTSD is described as the development of characteristic symptoms following exposure to trauma. One characteristic PTSD symptom involves the persistent re-experiencing of the event, often in the form of intrusive thoughts, dreams, and flashback sensations. Another symptom is the avoidance of cues associated with the trauma, such as the elements of the context in which the event occurred, the feelings and thoughts experienced at the time of the event, and aspects of the individual's life that arouse recollections of the event. This avoidance also includes responsive numbing, where the individual avoids all experience of emotions and effectively detaches from others. Finally, PTSD is often marked by symptoms of increased physiological arousal, such as difficulty sleeping, increased irritability, hypervigilance, and an increased startle response (APA, 2000; Foa et al., 1995; Kilpatrick et al., 1998; Taylor, Kuch, Koch, Crockett, & Passey, 1998).

A significant amount of research has been conducted over the past 20 – 30 years that has done much to further our understanding of the etiology and mechanisms that underlie PTSD. Researchers have consistently found the symptoms to cluster into three categories of re-experiencing, avoidance and numbing, and hyperarousal (Ehlers & Clark, 2000; Fairbank et al., 1983; Foa et al., 1995; Kilpatrick et al., 1998; Taylor et al., 1998). There has also been an abundance of research on the risk factors, aside from exposure to trauma alone, that make a person more vulnerable to the development of PTSD. Among the most cited risk factors are psychiatric history, poor education, low intelligence, low socioeconomic status, minority race status, female gender, childhood abuse, previous trauma, family psychiatric history, age at exposure, lack of social support, and additional life stress (Brewin, et al., 2000). Other cited risk factors have included poor coping models, low perceived-efficacy, and externalized locus of control (Bandura, 2001; Benight & Bandura, 2004; Frydenberg & Lewis, 2004; Luthar, 1991).

Trauma research has also included an exploration of the cognitive factors that mediate and maintain the development of PTSD following trauma exposure (Brewin et al., 2000; Briere, 1992; Briere & Jordan, 2009; Ehlers & Scott, 2000). Ehlers and Clark (2000) noted that PTSD appears to be maintained when trauma survivors process their experience such that it leads to a sense of serious current threat. They specifically pointed to excessively negative appraisals of the trauma and its aftermath as presenting difficulties in recovery (Ehlers & Clark, 2000). PTSD was reported as more persistent when autobiographical memory for the event was disturbed and marked by poor elaboration and contextualization, strong associative memory, and strong perceptual priming where sensory stimuli are conditioned as traumatic cues (Ehlers & Clark, 2000; Foa et al., 1995; Resick & Schnicke, 1992).

Other researchers have also investigated the role of cognitive factors in the development and maintenance of PTSD. Several studies have pointed to the importance of low perceived self-efficacy and poor sense of control as contributing to negative outcome following trauma (Benight & Bandura, 2004; Frydenberg & Lewis, 2004; Luthar, 1991). This finding is consistent with other studies that have shown perceptions of uncontrollability and unpredictability to be associated with higher levels of distress (Foa et al., 1992; Janoff-Bulman, 1985). Briere and Scott (2006) also noted a specific range of cognitive distortions associated with traumatic distress in survivors of long-term interpersonal trauma. These distortions include self-blame, self-criticism, helplessness, hopelessness, and preoccupation with danger, many of which overlap with previously cited cognitive risk factors of low self-efficacy and perceptions of unpredictability and lack of control (Briere & Scott, 2006).

Complex PTSD and Disorders of Extreme Stress. Regardless of whether those with trauma-related distress meet diagnostic criteria for PTSD or not, it seems important to consider the effect of associated psychological distress on long term physical health in order to gain a more comprehensive understanding of the pathways in which trauma impacts health. A significant number of studies have identified a range of associated symptoms that seem to be a more complex derivation of the three PTSD diagnostic clusters of re-experiencing, avoidance/numbing, and hyperarousal (Foa et al., 1995). Many of these symptoms overlap with DSM-IV symptoms of PTSD and other mental disorders, such as depressed mood, anxious arousal, anger and irritability, dissociation, intrusive experiences, and defensive avoidance (Briere, 1992; Briere & Jordan, 2004; Luxenberg et al., 2001a; 2001b; van der Kolk et al., 2005). Other noted associated symptoms were impaired self-reference, tension reducing behaviors, sexual concerns, and dysfunctional sexual behavior, as well as problems with affect regulation

and distorted, trauma-related cognitions related to the experience of shame, guilt, and helplessness (Briere, 1992; Briere & Jordan, 2009; van der Kolk et al., 2005).

The symptoms discussed above have been considered by many researchers in the field of interpersonal and chronic traumatology to provide a more comprehensive understanding of the range of responses to trauma than current DSM conceptualizations of PTSD (Briere & Jordan, 2004; Luxenberg et al., 2001a; Roth et al., 1997; van der Kolk et al., 2005). They argue that chronic interpersonal trauma, particularly sexual and physical abuse, leads to more complex symptomology than is represented in the current criteria, particularly in the areas of interpersonal functioning and impaired self-reference (Briere, 1995; Briere & Jordan, 2004; Luxenberg et al., 2001a; Roth et al., 1997; van der Kolk et al., 2005). Given the high prevalence of these types of chronic traumatizations, along with recent evidence regarding the cumulative negative effects of polyvictimization, it is essential to consider the variable effects of chronic, more complex traumatic distress when examining the relation between trauma and physical health.

Mood and anxiety disorders and symptoms. It is also very important to consider the role of alternative reactions to trauma that do not necessarily reflect traumatic distress, but may also have a significant impact on physical health outcomes following trauma exposure. Many studies have identified significantly higher rates of clinical depression in those individuals who have been exposed to trauma than in those who have not experienced trauma (Brewin et al., 2000; Briere & Scott, 2006; Calhoun, Wiley, Dennis, & Beckham, 2009; Dennis et al., 2009; Ehlers & Clark, 2002; Resick & Schnicke, 1992; Suris & Lind, 2008). In fact, Campbell (2002) identified depressive symptoms reported by women in primary care as a stronger indicator of domestic violence than symptoms of posttraumatic distress. Other studies have identified significant symptoms of anxiety independent from that of PTSD in individuals who have

experienced trauma. Among the most commonly reported anxiety disorders following trauma are Generalized Anxiety Disorder and Panic Disorder (Briere, 1995; Briere & Scott, 2006; Kessler et al., 1995). Although clinical PTSD may not be present, distress associated with depression and other anxiety disorders has significant potential to negatively impact one's physical health functioning.

V codes. Many individuals with histories of interpersonal trauma may exhibit few symptomatic effects related to a traumatic response, yet may still experience alterations in mood and /or behavior. For those individuals who have experienced trauma but do not meet criteria for PTSD or any other classifiable mental health disorder, DSM-IV has included a way to conceptualize their symptomatic distress as trauma-related by allowing for the classification of v-codes as a reason for treatment seeking (APA, 2000). Trauma related v-codes include "physical/sexual abuse of adult", "neglect/physical/sexual abuse of child", and descriptors as mild as "relational problem" (APA, 2000). Although those who receive a v-code diagnosis are not necessarily experiencing clinically significant posttraumatic symptomology or other DSM diagnoses, it is important to note the presence of such a significant stressor that may be contributing to the individual's overall psychological distress. It is equally as important to account for the presence of psychological distress, even if it is subsyndromal, as it may also have an impact on physical health. DSM includes diagnoses such as "Adjustment Disorder with Mixed Anxiety and Depressed Mood" and "Adjustment Disorder, Not Otherwise Specified (NOS)" to describe levels of distress that are presenting clinical concern in response to a stressor but do not meet criteria for diagnosis of PTSD, Major Depressive Disorder, or other anxiety disorder (Elliott, Mok, & Briere, 2004; APA, 2000).

It is essential to our understanding of how trauma impacts physical health to recognize the potential for an incredibly diverse range of reactions for any given individual following trauma exposure. While PTSD is most commonly associated with trauma, empirical research has shown that PTSD is actually not the most common response to trauma (Bonanno et al., 2010; Connor et al., 2003; McNally, 2003; Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993), Most who experience trauma respond in a way that allows them to maintain a stable level of functioning, or if not, return to a stable state in relatively short time (Mancini & Bonanno, 2006). Long-term responses to trauma can take many different pathways and symptomologies, all of which have the potential to impact changes in one's overall physical health functioning.

Resilience

Because of the variability in symptomatic outcomes following trauma, researchers have also become interested in the factors that may moderate or mediate psychological and physical health outcomes. New directions in trauma research have included an investigation into the phenomenon of resilience, conceptualized as the ability to achieve or maintain positive and adaptive level of functioning in spite of extreme stressors, such as developmental or environmental adversity, traumas, or other negative life events (Agaibi & Wilson, 2005; Bonanno, 2004; Lepore & Revenson, 2006; White, 2009). Although much of the trauma literature has focused on the negative impact of trauma in terms of PTSD and associated symptoms in mood, behavior, and personality, the growing recognition that a wide range of symptomatic responses follow trauma has led researchers to consider ways in which some individuals who experience trauma are able to avoid or minimize significant psychological distress such as PTSD (Agaibi & Wilson, 2005; Rutter, 1993; Taft et al. 1999; White, 2009). Emerging research has begun to examine the salutogenic effects of positive psychological

functioning, focusing on aspects of mood, personality, and temperament (Anderson & Anderson, 2003; Thompson, Arnkoff & Glass, 2011; Steptoe, Dockray, & Wardle, 2009; Tremblay et al., 2006)). There have not, however, been published studies investigating of the role of resilience, specifically. This may be due, in large part, to the lack of consensus in conceptualizing the phenomenon of resilience (Luthar & Cushing, 1999).

History of resilience conceptualization and measurement. The exploration of resilience has evolved from a conceptualization as criterion variable to a more in-depth investigation of resilience as a dynamic process resulting in a positive outcome. Historically, researchers first conceptualized resilience as a dependent variable representing positive outcome (e.g. completed education, lack of teen pregnancy, absence of significant psychological distress) (Garmezy, 1993; Luthar, 1991; Rutter, 1985), then expanded their operationalization to include consideration of coping and appraisal factors that allow for resilience. More recently, researchers have turned their attention to the construct of resilience as a process of adaptive recovery from trauma and other adverse life circumstances (Bonnano et al., 2010; Egeland, Carlson, & Sroufe, 1993; Lepore & Revenson, 2006; Richardson, 2002; White, 2009). Each of these definitions will be discussed in turn.

Initially, resilience research focused on the construct in children, particularly those facing adversity in their developmental environments. Positive or resilient outcomes were described as adaptive success in future expectation, self-reliance, capacity for healthy interpersonal relations, absence of substance use, lack of delinquent behavior, and absence of psychopathology (e.g. anxiety, depression, and somatization) (Garmezy, 1993; Luthar, 1991; King, King, Fairbank, Keane, & Adams, 1998; Rutter, 1987; 1993). Those who exhibited resilience were described as finding a meaning or purpose in life, often believing that they somehow could overcome and

make a difference. Resilient children also shared the belief that they were able to influence their environments in order to achieve their desired outcome. Finally, resilience was described as believing that one can learn and grow from both positive and negative experiences, making them more likely to be able to make the best of terribly difficult situations (Hoge, Austin, & Pollack, 2007).

Current research has taken an interest in resilience as it pertains to bereavement, as well as a response to terrorist acts, especially in those who witnessed or were directly affected by the World Trade Center attacks on September 11, 2001 (Bonanno et al., 2010; Mancini & Bonanno, 2006). In these studies, resilience was defined as "the ability of adults in otherwise normal circumstances who are exposed to an isolated potentially highly disruptive event...to maintain relatively stable, healthy levels of psychological functioning" (Mancini & Bonanno, 2006, p. 972). According to Mancini and Bonanno (2006), the capacity to maintain conformity between one's "pre-trauma" and "post-trauma" identities results from the repeated experience of relatively fixed interactions with people for whom one has an emotional attachment. These attachment patterns and experiences play a huge role in the development of a multidimensional identity, which contains a well-developed and elaborate self-structure that will be able to withstand the effects of such highly disruptive events.

In addition to having stable attachment relationships, resilient people may also utilize characteristic mechanisms to maintain a continuity of identity. Their world-view employs the use of effective coping and sense-making in an attempt to restore beliefs about themselves. An example would be "death is a part of life," "bad things happen to good people," and "everything happens for a reason". They also are characterized as having an overly favorable and somewhat "positive illusion" of themselves as a method of self-enhancement. For example, a resilient

person would tell themselves that "I have control over my own destiny", "I do things for a reason," etc. This overly positive self-view protects and restores self-integrity, serves to promote self-growth, and may actually serve as a buffer from the effects of significant negative life events (Mancini & Bonanno, 2006).

Resilient individuals have also been conceptualized as more likely to focus on concrete aspects of themselves, such as the roles they fill, their behaviors, goals, and plans (Bonanno et al., 2010), rather than focusing on the negative impact and disruption traumatic experiences may have on one's sense of self and purpose. Because these aspects of themselves are more controllable than characterological traits, they are more easily maintained after traumatic events. In a sense, the concrete personal characteristics help the individual to realize that they are, despite their great internal disruption, essentially the same person in terms of their place in the world (Mancini & Bonanno, 2006). Another important mechanism resilient individuals have been thought to possess is that of emotion regulation. Regulation of emotions fosters resilience and promotes identity continuity through social identity and embeddedness, and strongly contributes to one's ability to manage the potential negative emotional and psychological effects of traumatic experience.

Most information on resilience comes from studies on the process or framework of resilience. Numerous studies have examined risk and protective factors and the manner in which they interact with environmental and other factors to produce a particular positive or negative outcome. In these studies, resilience is described both in terms of successful adaptation as well as the process of interpersonal and environmental transaction that produces a successful outcome (Lepore & Revenson, 2006; Rutter, 1993). The adaptive processes that resilience serves are reduction of risk impact, reduction of negative chain reactions, establishment and maintenance of

self-identity and self-efficacy, and opportunity enhancement (Rutter, 1985). As the study of resilience has enumerated the various risk and protective factors for successful adaptation, both individual and environmental, the need for a social-ecological perspective has been recognized. This view conceptualizes resilience as the result of the interplay between multiple personal and environmental factors (Lepore & Revenson, 2006). When looking at resilience as a transactional process, it is important to note, "any constitutional or environmental factors may serve as vulnerabilities, protective, or risk variables, directly or indirectly influencing behavior" (Egeland et al., 1993, p. 517). The individual is an active participant in the developmental process of incorporating new experiences and feelings about interactions into a behavioral system of increasingly complex reactions to life events. This system of beliefs and interactional patterns influences how environmental cues are interpreted and organized, making early experiences the template on which later experiences are organized (Egeland et al,. 1993). Following this framework, the capacity for resilience is a developmental process, taking place in the context of environmental influences and support.

Specific factors contributing to resilient processes. Recent research has begun to investigate the processes that facilitate positive recovery from trauma. Bonanno et al. (2010) report that resilience is, in fact, the most common outcome following aversive events, yet the process of resilient responding may take a range of trajectories. The authors point to multiple independent personal and environmental influences that enable a person to respond resiliently to a potentially traumatic event.

In perhaps one of the most comprehensive reviews of the topic, Bonanno et al. (2010) outline a range of responses one may have to a potentially traumatic event: resilience, recovery, chronic distress, delayed distress, continuous distress, and distress-improvement. Resilience, or

the "ability to maintain relatively stable, healthy levels of psychological and physical functioning" (Bonanno, 2004, p. 20) after exposure to a potentially traumatic event, is associated with temporary symptoms of distress with minimal impairment, followed by a return to relatively stable functioning relatively soon after the event. Recovery is instead marked by elevated distress and functional impairment after the event, followed by gradual return to normal functioning. Chronic distress responses are characterized by a sharp elevation in symptoms and impairment that may persist for years after experiencing the traumatic event. Delayed distress consists of impairment due to moderately elevated symptoms soon after the event, with gradual worsening over time. According to Bonanno et al. (2010), other variations of responding following trauma include continuous distress, which includes impairment that predates that event itself, and distress-improvement, where the individual has elevated distress prior to the potentially traumatic event that significantly decreases after the traumatic experience.

Bonanno et al. (2010) proposed that a range of risk and resilience factors interact in a conjunctive fashion, where each factor adds to or takes away from the predictive likelihood of a particular post-traumatic outcome. Some factors are stable over time while others are subject to environmental or circumstantial influences in their role on long-term outcomes following potentially traumatic events. Personality, for example, is one such stable factor that may contribute to the course and outcome of one's adjustment to traumatic events. Many studies have shown that higher levels of perceived control and trait resilience, along with low levels of negative affectivity and ruminative cognitive tendencies, are significantly associated with more positive post-event outcomes (Bonanno et al., 2010; White, 2009). Additionally, trait self-enhancement, or holding "positive illusions" about oneself, was found to be linked to resilience, along with high perceived coping self-efficacy, and high positive affectivity (Taylor & Brown,

1988). These temperamental and cognitive styles are relatively stable aspects of one's personality, and contribute significantly to one's ability to respond adaptively to high levels of stress, traumatic or otherwise.

Bonanno et al. (2010) also identified several demographic factors that have been strongly linked to resilience outcomes following trauma, including male gender, older age, and higher level of education. Minority ethnic status has also been linked to less resilient outcomes (Bonanno et al., 2006; Egeland, et al., 1993; Rutter, 1993), though these results are somewhat difficult to distinguish from the significantly negative impact of lower socioeconomic statuses often seen in minority ethnic populations. When SES factors have been controlled, race and ethnicity are usually no longer predictors of resilient outcomes (Bonanno et al., 2007).

Social supports have also been discussed repeatedly as a crucial buffer in facilitating psychological adjustment following trauma (Bonanno et al., 2007; Bonanno et al., 2010; Egeland et al., 1993; Rutter, 1985). These resources may include emotional, instrumental, informational, and economic support. Another important point to consider, however, is the degree to which the trauma survivor chooses to, or is able to use these resources for their benefit. This process may also be affected by several other influences such as level of distress, personality factors, economic resources, and other demographic factors.

It is important to note that an individual may have a high rate of trauma exposure and still exhibit strong evidence of resilience (Bonanno et al., 2010; Egeland et al., 1993; Garmezy, 1993; Lepore & Revenson, 2006; Rutter, 1993; White, 2009). However, level of exposure to traumatic events was highlighted as one of several cumulative factors predicting resilience (Bonanno et al., 2010). As one may expect, close, personal, repeated exposure is associated with more

psychological distress, while more distant, reduced exposure to trauma is associated with greater resilience and less psychological distress.

Exposure to other prior and current significant life stressors has been repeatedly linked to an increased risk for PTSD, particularly when the previous stressors led to PTSD (APA, 2000; Breslau, Peterson, & Schultz, 2008; Brewin et al., 2000). Previous and current life stress has also been associated with more difficult adjustment to traumatic aftermath (Bonanno et al., 2007; 2010.) Research has not clarified the association between resilience to prior traumatic events and resilience to subsequent events, though it has been hypothesized that exposure to some types of trauma (such as disasters or accidents) may better prepare a person to respond adaptively to subsequent traumatic events (Bonanno et al., 2010).

Positive emotions play a particularly salient role in predicting resilience to potentially traumatic events, a topic that has been exhaustively researched across investigations of resilience (Bonanno et al., 2010; Connor & Davidson, 2003; Connor et al., 2003; Egeland et al., 1993; Luthar & Siglar, 1991; Rutter, 1993). Bonanno and others found, in a series of studies following the 9/11 attacks, that positive affectivity mediated the relationship between personality trait-like factors (e.g. self-enhancement, ego resilience) and positive adjustment in response to talking about the attacks (Bonanno et al., 2006; 2007; Frederickson et al., 2003). These findings show that proximal emotionally positive responses in trauma processing may buffer against development of psychopathology like depression surrounding potentially traumatic events.

While Bonanno et al. (2002; 2006; 2007; 2010) conducted extensive explorations of the nature and process of resilience in a series of well-designed empirical studies, it is important to note that they focused their sampling among survivors of those lost in the 9/11 terror attacks in

New York City, focusing primarily on resilience to bereavement trauma versus that of a range of more commonly experienced traumatic events. Their results are therefore somewhat limited to bereaved populations, and the findings may not be fully generalizable to those individuals who responded resiliently to other types of trauma. Bonanno et al.'s (2002; 2007; 2010) findings are also limited by the conceptual nature their work, such that resilience was measured and discussed according to factors previously found to contribute to positive outcomes following trauma exposure. Although the breadth of Bonanno's work has done much to contribute to further understanding and a more comprehensive conceptualization of resilience (2005), generalizability of findings have also been limited by not developing and/or utilizing a conceptual unitary measure to assess processes of positive functioning following trauma exposure. A comprehensive approach to resilience assessment is needed for a more unified operationalization of the construct to be established so that findings in future studies may be more easily translatable and generalizable within the resilience literature.

Connor and Davidson (2003) proposed a similar model to describe both the characteristics and process of resilience in their development of the Connor-Davidson Resilience Scale, a measure used in this study. They viewed resilience as a process to reestablish emotional, physical, and spiritual homeostasis, where the individual's ability to cope is influenced by previous experiences adapting to stressful situations. Connor and Davidson also emphasized that some resilient, or protective, resources may vary in their effectiveness. They also pointed out that resilient resources may interact with other risk and protective factors to result in variable outcomes following trauma exposure.

Like Bonanno et al. (2010) and other researchers (O'Leary, 1998; Richardson, 2002), Connor and Davidson (2003) outlined a range of responses to traumatic "disruption of homeostasis" (p. 77). The process of recovery may lead to a type of post-traumatic growth, where the traumatic event represents an opportunity for positive development (e.g. "That which does not kill us makes us stronger…"), and successful adaptation results in increased resilience. The individual may also experience a return to their previous level of functioning where the person is able to move beyond the experience with no significant distress. Additionally, the person may achieve a level of recovery with some degree of loss, where they establish a new, somewhat lower baseline of functioning. Finally, the traumatic event may result in significant distress, where the individual exhibits maladaptive coping strategies and poor overall functioning (Connor & Davidson, 2003).

In the development of their resilience scale, Connor and Davidson (2003) utilized items from several prominent, conceptually related constructs that have been examined previously in resilience research. They included questions evaluating aspects of control, commitment, and views of stress or change as opportunity based on Kobasa's seminal 1979 work on hardiness. Concepts from Rutter's work (1985; 1993) were reflected in items assessing a person's ability to develop a strategy with clear goals, orientation to taking action, strong self-esteem, social and problem-solving skills, humor in the face of stress, taking the strengthening effects of stress, secure emotional bonds, and previous experiences with success. Connor and Davidson also included items, based on reported anecdotal experiences and their own empirical research (2003), which examined the role of faith and belief in benevolent interventions (e.g., luck, fate) to assess the role of spirituality in the process of resilience.

Variability in resilience. Due to the dynamic nature of resilience and its development, there are likely significantly diverse forms and trajectories of the process itself. It has been suggested that resilience is not a stable characteristic that is present regardless of experience. Individuals may respond to trauma resiliently at one point, or with little distress, and may struggle with other traumatic events at another time (Rutter, 1993). Additionally, victims may succumb to some pressures, such as the experience of depression or anxiety, but are able to avoid others, such as social isolation or substance use (Luthar & Zigler, 1991). The multifaceted nature of resilience implies that it may be a gradual process, and that its manifestation comes in the capacity to recover functioning over time. It may be that transformations that occurred when coping with previous life stressors play a role in the development of resilience for current and future distressing life events (Bonanno, 2005).

Given the wide range of variability in resilient processes and outcomes, it is not surprising to find that those who identify as resilient, according to Connor and Davidson's model, also report psychological symptoms of distress, though not necessarily at a level of clinical significance (White, 2009). When investigating the role of resilience in predicting psychological distress following trauma in a college-age convenience sample, this author found that low levels of resilience contribute to more traumatic distress and high levels of resilience contribute to less traumatic distress. While the relations between the symptomatic distress and resilience were significant, the effect sizes were less robust than anticipated, suggesting that resilience is not simply the opposite or absence of distress and psychological symptomology, as had been previously conceptualized. The results indicate that resilience may have more to do with one's subjective cognitive perception of how one is functioning rather than an objective listing of the presence or absence of psychological symptoms. It is also possible that the

participants acknowledged their experience of symptomatic distress and perceived themselves as resilient despite their level of distress, perhaps because they felt that it could be or had been much worse than it was currently. The results may also indicate the presence of a recovery curve following negative life events. Of the more than 200 participants, some individuals may have been at different stages of recovery following their traumatic experience, allowing for the continuing presence of significant psychological symptoms. The results suggest that one may be cognitively resilient and still exhibit emotional and behavioral symptomatic distress. Overall, the findings from the study provided further evidence that resilience is a very complex construct that cannot be explained simply in terms of absence of symptoms or other negative outcomes (White, 2009).

This and results from other studies have given support to the conceptualization of resilience as a dynamic process with significant variability in trajectory and eventual outcome (Bonanno et al., 2010; Lepore & Revenson, 2006; Mancini & Bonanno, 2006; Richardson, 2002; White, 2009) As such, a wide range of psychological and physical distress may be experienced at any point and potentially throughout an individual's particular resilient process. It is also possible that positive factors associated with resilience may ameliorate distress associated with traumatic experiences, particularly those such as the ability to regulate emotion, access to social supports, positive mood, and positive views of self (Bonanno et al., 2010; Connor & Davidson, 2003).

While several researchers, Bonanno et al. in particular (2010), have contributed significantly to an increased understanding of the phenomenology of resilience, the work has been primarily conceptual in nature and has not yet resulted in a unified conceptualization or method of measurement. Connor & Davidson's resilience scale (CD-RISC, 2003) has been the

most comprehensive integration of the existing literature surrounding resilience, and represents one of the first attempts to measure resilience as a unitary construct. The measure reflects a view of resilience as a confluence of cognitive and behavioral coping approaches identified based on cognitive changes and improvement in adaptive functioning with treatment for traumatic distress (Connor & Davidson, 2003). As discussed earlier, Connor and Davidson (2003) developed a measure that captures the dynamic nature of resilience, along with the recognition of the construct as an interaction of multiple aspects of adaptive functioning, particularly in terms of cognitive approaches to managing the aftermath of trauma exposure. However, this scale's assessment of resilience provides a comprehensive, unitary measure of a given individual's level of resilience as contributed to by multiple dimensions of positive psychological functioning.

The role of resilience in the development and experience of physical health problems following trauma is unclear, as there have been very few studies to examine resilience and physical health, and those have merely explored the role of presumed resilient factors (e.g. positive mood, optimism, vitality) (Anderson & Anderson, 2003; Richman, Kubzansky, Maselko, Ackerson, & Bauer, 2009; Taylor & Brown, 1988; Tremblay et al., 2006). There is significant evidence to suggest that resilience acts as a buffer, or protective factor, against the long-term negative physical health effects possible following trauma exposure (Anderson & Anderson, 2003; McIntosh, Poulin, Silver, & Holman, 2011; Thompson et al., 2011; Tremblay et al., 2006). However, given the potential for a wide range of symptoms and trajectories in resilient processes, there may still be a risk for the development of health problems in individual histories. Given the high base rate of trauma exposure among adults, and the strong evidence that only a small percentage respond with symptoms that diagnostic criteria for PTSD, it is

important to better understand how the process of adaptive recovery affects both mental and physical health.

Rates of Trauma Exposure

As cited previously, national prevalence and comorbidity studies have indicated wide-spread incidence of traumatic events across the general population (Jankowski, 2003; Fairbank & Fairbank, 2009; Kessler et al., 1995). It has been estimated that approximately half of the population has experienced at least one traumatic event in their lifetime, with the majority of those reporting more than one trauma occurrence in their lifetime (Kessler, 1995; Kilpatrick, 2008). Other studies have supported findings from the NCS (Kessler et al., 1995) and the National Center for PTSD (Jankowski, 2003) regarding the prevalence of trauma exposure (Fairbank & Fairbank, 2009).

Interpersonal violence has become an area of particular interest for trauma researchers (Briere & Jordan, 2004; Briere & Scott, 2006; Campbell & Lewandoski, 1997; Herman, 1997; van der Kolk et al., 2005; White, 2009). Several researchers have found that survivors of prolonged interpersonal trauma, especially early in life, had high rates of problems with regulation of affect and impulses, memory and attention, self-perception, interpersonal relations, somatization, and systems of meaning (Briere, 1992; Briere & Jordan, 2009; Luxenberg et al., 2001a; van der Kolk, et al., 2005). These types of prolonged, interpersonal abusive experiences have significant deleterious effects on the victims' sense of safety, trust, self-worth, and overall sense of self (Briere & Jordan, 2009; Briere & Scott, 2004; Luxenberg et al., 2001b; Roth et al., 1994). These cognitive disturbances are usually in addition to physiological and other symptoms meeting full or at least partial criteria for PTSD (Kilpatrick et al., 1998). Since women are much

more likely to experience interpersonal trauma than men, they may therefore present a need for more consideration of these associated symptoms when evaluating responses to trauma exposure in female populations (Clouse & Sherif, 2008; Kilpatrick et al., 1998; Tjaden & Thoennes, 1998; van der Kolk et al., 2005).

The National Violence Against Women survey (Tjaden & Thoennes, 1998), which surveyed both men and women, found that, overall, violence against women is much more prevalent than violence against men. Additionally, they found that violence against women is primarily interpersonal, perpetrated by a close other, and begins at an early age. The results also showed that women are significantly more likely to experience rape and/or other forms of forced sex than men, while men are more likely to experience physical assault. Nearly 18% of all women surveyed reported being a victim of an attempted or completed rape in their lifetime, compared with 3% of men reporting the same. Additionally, 22% of those women reporting attempted or completed rape experienced it prior to the age of 12, while 52% experienced the abuse between the ages of 12 and 17. These findings suggest that more than half of sexual assaults occur to women under the age of 18 (Tjaden & Thoennes, 1998). In summary, these findings suggest that violence against women may be an endemic problem, and indicate the importance of considering women as a population particularly vulnerable to the effects of traumatic stress.

Pathways Through Which Trauma Impacts Physical Health

Recently, attention has turned to examining the manner in which traumatization contributes to physical health problems in terms of the biological and psychological pathways taken for traumatic distress to manifest as physiological symptomology. Researchers in this area

have suggested a range of multiple pathways through which traumatic exposure can potentially lead to the development of physical health problems (Schnurr & Green, 2004; Kendall-Tackett, 2008). Based on the presumption that PTSD at least partially mediates the relation between trauma and health problems, it is thought that physiological, psychological, behavioral, and attentional mechanisms affected by the trauma are altered or activated to increase the allostatic load on the body.

For instance, psychological mechanisms, such as anxiety and depression, can lead to cardiovascular disease (CVD), hypertension, and poor behavioral coping skills such as substance use or excessive risk-seeking, which lead to significant health risks in themselves (Anderson & Anderson, 2003; Boscarino, 2008; Schnurr & Green, 2004; Stein et al., 2009). Trauma also alters biological stress response and immune systems (e.g. HPA-axis) to create a chronic level of stress that slowly damages cardiovascular, digestive, and nervous systems (Boscarino, 2008; Gill et al., 2009; Schnurr & Green, 2004). Attentional resources may also be reallocated, such that trauma victims' awareness of bodily changes and emotional sensitivities is significantly heightened, perhaps in efforts to avoid thinking about the trauma or to communicate to others that they are in distress and are in need of care (Hien et al., 2009; Kendall-Tackett & Klest, 2008; Leserman & Drosman, 2007; Schnurr & Green, 2004). This pathway, in particular, likely plays a factor in the type of symptoms and frequency of presentation a traumatized individual displays.

It is also highly likely that trauma victims experience problems in more than one area of functioning, increasing the allostatic load on the stress response system and potentially leading to increased risk of specific health problems (Friedman & McEwen, 2004; Gill et al., 2009; Kendall-Tackett, 2009; Kendall-Tackett & Klest, 2008; Leserman & Drosman, 2007; McEwen, 2000; Schnurr & Green, 2004). Perhaps some combinations are more likely to lead to CVD,

while others are more likely to contribute to digestive and somatic problems. It is possible that certain populations are more likely to exhibit post-traumatic distress in one domain over another, a finding that could lead to increased knowledge of diagnostic and preventive care for those who have been traumatized (Campbell, 2002; Campbell & Lewandoski, 1997; Eadie et al., 2008; Iverson et al., 2011; Martin et al., 2008; Schnurr & Green, 2004). It is also just as important to explore the tendencies of resilient individuals, perhaps to uncover the factors involved in a post-traumatic response that prevents the development of PTSD and/or associated physical health problems, or perhaps to reveal the physical health concerns that trauma victims may experience at a subclinical level, despite nonclinical levels of psychological distress.

Physiological mechanisms. Several researchers (Friedman & McEwen, 2004; Gill et al., 2009; Kendall-Tackett & Klest, 2008; Schnurr & Green, 2004) have emphasized that trauma affects physical health through its negative impact on the immune response system and the nervous system, the two main components of the body's primary stress response system. Gill et al. (2009) hypothesize that exposure to trauma activates the hypothalamic-pituitary-adrenal axis, which activates the "fight-or-flight" response by increasing levels cortisol, norepinephrine, and epinephrine. The increase in cortisol redirects energy for stress response, also reducing the activity of the immune system and elevating blood glucose levels. Cortisol also shuts down the fight or flight response by activating the negative feedback response to the HPA axis by increasing the number and sensitivity of glucocorticoid receptors (Gill et al., 2009; Schnurr & Green, 2004). While this acute stress response system acts normally in discrete periods of threat, when the threat or trauma is excessive or prolonged it becomes overworked and dysregulated (Gill et al., 2009). Alterations in the HPA axis subsequently lead to dysregulation of the immune

response system, increasing the risk for excessive inflammation (Gill et al., 2009; Kendall-Tackett, 2009).

Campbell (2002) also pointed to the negative effect of sexual trauma on gynecological health, not only by creating direct physical trauma, but by also increasing the risk for long-term negative health effects, such as vaginal inflammation and infection, pelvic inflammation, sexually-transmitted diseases, and urinary tract infections. Visceral sensitivity is also increased by trauma involving vaginal and/or anal injury, such that there is increased awareness of distress associated with gynecological and gastrointestinal functional disorders (Campbell, 2002; Leserman & Drosman, 2007). This increased awareness of gynecological and gastrointestinal dysfunction may be a function of, and may also contribute further to, negative associations of physical distress with prior experience of trauma.

Psychological mechanisms. Several prominent studies have recently investigated the role of psychological mechanisms (specifically PTSD) as a mediator through which physical health problems arise following traumatic exposure (Chaudieu et al., 2011; Kendall-Tackett, 2009; Schnurr & Green, 2004). In a review of many of these studies, Schnurr & Green (2004) found consistent results showing symptomatic distresss meeting clinical criteria for diagnosis of PTSD as a significant mediator between trauma and physiological symptomatic distress. Although considerable attention was paid to the impact of depression, anxiety, and poor cognitive and behavioral coping on physical health, the authors concluded that levels of distress consistent with a PTSD diagnosis contributed a unique effect to the development of health problems (Schnurr & Green, 2004).

Other researchers have recognized the important effect of PTSD on physical health, but have questioned its necessity as a prerequisite for the development of health problems following

trauma. Kendall-Tackett & Klest (2008) identified a number of emotions, cognitions, and behaviors commonly associated with PTSD that may contribute to chronic stress on the body. They make the important point that individuals may experience a range of psychological distress following trauma, including mood disorders, such as depression, and an assortment of anxiety disorders independent of PTSD (Kendall-Tackett & Klest, 2008; Kendall-Tackett, 2009). Psychological processes associated with depression, anxiety, and anger or hostility hold significant risk in themselves for health problems, with previous studies showing that these risk factors increase the immune system's inflammatory response (Campbell, 2002; Kendall-Tackett & Klest, 2008; Kendall-Tackett, 2009; Tucker, Jeon-Slaughter, Pfefferbaum, Khan, & Davis, 2010).

Calhoun et al. (2009) further investigated the independent effects of depression and somatization on health outcomes following trauma. Their study reported the frequent comorbidity of Major Depressive Disorder (MDD) and somatization with diagnoses of PTSD (Campbell, 2002; Kessler et al., 1995; van der Kolk et al., 2005), noting that MDD has been often linked to poor health and decreased functionality. It also goes without saying that somatization itself has long been conceptualized as the physical manifestation of psychological distress (Calhoun et al., 2009; Luxenberg et al., 2001b; van der Kolk et al., 2005), and is naturally assumed to be associated with increased physical health complaints. However, the results of this study suggest that the impact of posttraumatic distress contributes a unique effect to the development of health problems. Calhoun et al. (2009) found that higher levels of posttraumatic distress were associated with more health complaints, regardless of the severity of reported depression or somatization.

PTSD: Is it a necessary mediator? Schnurr & Green (2004) conceptualize PTSD as a

key mechanism through which trauma leads to poor health, arguing that the symptoms of PTSD may be risks to overall physical health simply within themselves. Closer attention to this postulation presents an important point for consideration. Each symptomatic characteristic of PTSD may present its own unique contribution to decreased health status in its range of symptomatic manifestation (Kendall-Tackett & Klest, 2008; Schnurr & Green, 2004).

PTSD symptoms as mediators. Re-experiencing via flashbacks and/or nightmares can lead to disruptions in sleep, which has long been known to have serious deleterious effects on physical health (Campbell, 2002; Kendall-Tackett, 2009; Schnurr & Green, 2004). These experiences also significantly increase physiological reactivity and intense distress (APA, 2000). This increased reactivity and distress often leads to higher incidence of anxiety and panic, presenting an overall risk for cardiovascular problems (Schnurr & Green, 2004).

Affective avoidance and numbing often manifests itself in depression, noted by Schnurr & Green (2004) to be strongly associated with greater platelet activity, decreased heart rate variability, hypertension, and cardiovascular disease. Avoidance and numbing can also include efforts at avoidant coping such as substance use and increased risk behavior (Campbell, 2002; Schnurr & Green, 2004), which presents a number of health risks too lengthy to review in this paper. Numbing via dissociation is also a common symptom of PTSD, which has been shown to be associated with increased reporting of somatoform disorders and multiple idiopathic physical symptoms (MIPS) (Schnurr & Green, 2004; van der Kolk et al., 2005).

Anxiety and panic are also hallmark symptoms of PTSD's final symptom cluster of hypervigilance and hyperarousal (APA, 2000). Difficulty falling and staying asleep is another high-risk symptom that increases cardiovascular problems (Campbell, 2002; Kendall-Tackett & Klest, 2008). Anger and irritability are also included in this cluster of symptoms, which has been

found to be associated with greater sympathetic (e.g. "fight-or-flight") arousal and less parasympathetic activity to respond by calming and turning off acute arousal, thereby increasing the overall risk for cardiovascular problems (Schnurr & Green, 2004).

While it is clear that individual symptoms of PTSD have the potential to exact negative effects on overall health, there are a myriad of other negative emotions, cognitions, behaviors, and coping mechanisms associated with subclinical posttraumatic distress that present a risk to health outcomes following trauma. Recent research has pointed to the role of PTSD in contributing to catastrophic interpretations of pain, higher anxiety, and intrusive distress that may simply interfere with the ability to cognitively and behaviorally manage chronic illness and pain (Wuest et al., 2008). Regardless of whether these maladaptive cognitive responses are in addition to PTSD, depression, subclinical levels of distress, or merely part of negative adjustment patterns following trauma, each has its own negative impact on physical health.

Cognitive and emotional changes. As discussed earlier, emotional and cognitive factors such as anger, hostility, and depression increase inflammatory responses, and have the power to do so with or without the presence of PTSD (Kendall-Tackett, 2009). Additionally, previous studies have found that abused women do not, as expected, present to primary care physicians specifically with symptoms of PTSD (Campbell & Lewandoski, 1997; Martin et al., 2008; Wuest et al., 2008). Instead, abused women primarily report symptoms of depression, which is a known correlate of traumatic distress (Briere & Scott, 2006; Campbell, 2002). Alterations in self-views, such as self-blame and low self-esteem, have also been found to be strong features of abuse responding (Campbell & Lewandoski, 1997). These findings provide further support for consideration of associated symptoms of complex PTSD when identifying posttraumatic distress in victims of more interpersonal-type traumas.

Attentional changes. Attentional resources may also be redirected, such that trauma victims' awareness of bodily changes and emotional sensitivities is significantly heightened, perhaps in efforts to avoid thinking about the trauma or even to communicate to others that they are in distress and are in need of care (Kendall-Tackett & Klest, 2008; Schnurr & Green, 2004). This pathway, in particular, likely plays a factor in the type of symptoms and frequency of presentation a traumatized individual displays.

A more direct explanation of the tendency to report more physical health symptoms following trauma exposure may be due to simple classical conditioning, where physiological cues become conditioned to elicit pain, perhaps as they did when first conditioned by the initial trauma (Foa et al., 1992). There is an abundance of research verifying the primary role of classical conditioning in the development of panic disorder (Bouton, Mineka, & Barlow, 2001), such that symptoms of panic are conditioned to elicit full criteria for a panic attack. The same can at least be said for the role of panic and anxiety in PTSD, so it is reasonable to consider the role of conditioning in eliciting physical health complaints (Bouton et al., 2001; Foa et al., 1995; Foa et al., 1992).

Behavioral changes. The negative impact of trauma and posttraumatic distress on adaptive behavior has been well-documented (Briere & Runtz, 1993; Foa et al., 1995; Foa et al., 1992; Kendall-Tackett & Klest, 2008; Kendall-Tackett, 2009; Schnurr & Green, 2004; Suris & Lind, 2008; Stessman et al., 2008). As discussed earlier, many of the behaviors may be unsuccessful efforts at coping, which may present significant health risks in their own right (Campbell, 2002; Kendall-Tackett & Klest, 2008; Schnurr & Green, 2004. There are many other ways, however, that trauma-exposed individuals may behaviorally react to the impact of traumatic stress. These changes may directly or indirectly have the potential to affect overall

well-being.

Behavioral risk factors have been consistently identified as contributing significantly to the development of chronic health problems across investigations of the link between trauma and physical health (Eadie et al., 2008; Felitti & Anda, 2009; Kendall-Tackett & Klest, 2008; Kendall-Tackett, 2009; Schnurr & Green, 2004). The most commonly reported maladaptive behaviors are alcohol abuse, tobacco use, drug abuse, social withdrawal, poor sleep hygiene, unsafe sexual practices, poor exercise, poor diet, and overall failure to engage in preventive strategies (Felitti & Anda, 2009; Kendall-Tackett & Klest, 2008; Kendall-Tackett, 2009; Schnurr & Green, 2004). Many of these maladaptive behaviors have been conceptualized as a functional manifestation of attempts to cope with traumatic stress-related symptoms of re-experiencing, hyperarousal, and avoidance (Eadie et al., 2008; Kendall-Tackett & Klest, 2008; Kendall-Tackett, 2009; Polusny, Dickinson, Murdoch, & Thuras, 2008; Schnurr & Green, 2004). Efforts to manage traumatic stress symptoms along with potential changes in mood and trauma-related cognitions may affect overall physical health through engaging in poor health behaviors and other impulsive or otherwise maladaptive behaviors (Briere & Runtz, 1993; Schnurr & Green, 2004)

Trauma-exposed individuals may not develop levels of distress that meet full criteria for PTSD, but they are still exceedingly vulnerable to the development of a number of psychological and behavioral responses that increase the risk for a poor health outcome. The presence of risk at multiple levels of psychosocial functioning suggests that trauma has the potential to exact a compounding effect on the overall mental and physical health of the individual (Kendall-Tackett & Klest, 2009; Schnurr & Green, 2004).

Questions still remain about the impact of subclinical traumatic symptomology on overall

physical health, as existing studies investigating the relation between trauma exposure and physical health have narrowed their focus on clinical levels of PTSD as a mediator in the development of physical health problems following trauma, (Campbell, 2002; Campbell & Lewandoski, 1997; Eadie et al., 2008; Schnurr & Green, 2002; Kendall-Tackett & Klest, 2008; Kendall-Tackett, 2009; Wachen et al., 2013). However, chronic stress may also arise from the experience of subclinical traumatic distress, and subsequently present a threat to one's physical health (Gill et al., 2009; Hien et al., 2009; Stessman et al., 2008; White, 2009). Although the distress that arises from subclinical posttraumatic stress symptoms (e.g. PSS) may result in a less severe impact on overall health than distress associated with a levels of distress meeting criteria for a clinical diagnosis of PTSD (Gill et al., 2009; Schnurr & Green, 2004; Wachen et al., 2013), it is important to empirically investigate what, if any, differences in physical health problems arising from chronic psychological distress exist in individuals with subclinical (e.g., PSS) as opposed to clinical levels (e.g., PTSD) of distress.

Role of resilience. Evidence of a variable range of responses following trauma exposure has been well-established in the empirical literature (Agaibi & Wilson, 2005; Bonanno, 2005; Brewin et al., 2000; Briere & Jordan, 2004; McNally, 2003; White, 2009). More recently, trauma researchers have become interested in the construct of resilience as a potential factor predicting fewer symptoms of psychological distress following trauma (Bonanno, 2004; Connor, 2006; DeRoon-Cassini et al., 2010; Lepore & Revenson, 2006; Walsh, Blaustein, Knight, Spinnazola, & van der Kolk, 2007). The majority of empirical investigations of resilience have focused on factors that allow a person to achieve or maintain positive mental health (Agaibi & Wilson, 2005; Richardson, 2002; Rutter, 1993), although recent research has shown that several dimensions of resilience and positive psychological functioning may serve as a buffer against the

development of health problems in general (Richman et al., 2009; Steptoe et al., 2009; Tremblay et al., 2006). While researchers investigating resilience has only recently used empirically and conceptually sound measures of this construct, as opposed to other constructs thought to be closely related to it (Connor, 2006; Connor & Davidson, 2003; Connor et al., 2003; White, 2009), a number of studies have found that positive factors (e.g., social support, spiritual faith, optimism) considered to be included in broad conceptualizations of the resilience construct may act as a buffer against the development of physical health complaints following trauma given findings from previous studies investigating the effects of optimism, positive affect, vitality, and other factors of positive psychological functioning on physical health (Anderson & Anderson, 2003; Steptoe et al., 2009; Tremblay et al., 2006; Yi, Vitaliano, Smith, Yi, & Weinger, 2006).

There have been few studies that have looked at resilience as a unitary construct in determining its impact on physical health (see White, 2009 for a review). The lack of concurrence regarding the definition and structure of resilience as a construct has forced most researchers to use aspects previously identified as characteristics of resilience as independent variables (Anderson & Anderson, 2003; Luthar & Zigler, 1991; Richardson, 2002; Steptoe et al., 2009; Richardson, 2002; Rutter, 1993; White, 2009). For example, previous studies have looked at different aspects of positive psychological well-being such as optimism, faith in a higher power, and utilization of social support as predictors of favorable health outcomes following diagnosis of disease (Anderson & Anderson, 2003). Regardless of the mechanisms or factors used to study the impact of resilient and/or positive psychological functioning on physical health, results have consistently indicated that positive routes buffer against the negative effects of trauma and stress (Anderson & Anderson, 2003; Tremblay et al., 2006).

There is growing evidence that factors of resilience and positive psychological well-being are conversely associated with reduced risk of physical illness and longer lifespan (Anderson & Anderson, 2003; McIntosh et al., 2011; Steptoe et al., 2009; Tremblay et al., 2006). A significant number of studies have found that elements of positive functioning, such as greater life satisfaction and healthier lifestyle, are associated with less risk for health problems and increased longevity (Anderson & Anderson, 2003; Steptoe et al., 2009; Stessman et al., 2008). One study examined the role of resilience, specifically, in the psychological adjustment and physical health in recently diagnosed diabetes patients (Yi et al., 2008). The authors found that individuals with low resilience were more likely to have poorer self-care behaviors in the face of stress, and those with high resilience were less likely to have worsening levels of blood insulin.

Several studies have examined the effect of positive affect on long-term physical health, and have consistently shown results suggesting that positive affect, or mood, predicts future health (Steptoe et al., 2009). Specifically, those with positive affect are much more likely to have lower levels of cortisol, lower heart rates, quicker cardiac recovery from negative emotions, better immune functioning, and less fibrinogen release in response to acute stress, which has been shown to lower overall risk for cardiac problems (Steptoe et al., 2009). Positive affect is also associated with positive psychosocial factors such as good social support, effective coping, good self-esteem, and optimism (Anderson & Anderson, 2003; Steptoe et al., 2009; Tremblay et al., 2006).

Some studies have focused on the role of optimism, specifically, in its impact on overall physical health. Optimism has been linked to both positive psychological and physiological functioning following traumatic stressors (Tremblay et al., 2006). It has also been considered as a positive personality construct, along with conscientiousness, another factor of resilience

(Richardson, 2002; Rutter, 1993). Optimism has been associated with lower risk for cardiovascular disease and greater longevity, as has conscientiousness (Smith, 2006). These aspects of personality and cognitive functioning consequently affect appraisals and coping patterns, which also impact physical health by moderating physiological responses to stressors that subsequently reduce the risk for the development of disease (Smith, 2006).

Other researchers have investigated the effect of hardiness, an early construct similar to conceptualizations of resilience, (Kobasa, Maddi, & Kahn, 1982; Luthar & Cushing, 1999; Richardson, 2002; Rutter, 1993), as a factor buffering against the negative effects of trauma and stress. In a study examining the role of personal resources in the development of PTSD and physical health problems following combat exposure, results showed that hardiness acted as a strong mediator between traumatic exposure and the development of PTSD and subsequent functional health impairment (Taft et al., 1999). This study also found that higher levels of social support, another important identified factor in resilience (Benight & Bandura, 2004; Richardson, 2002; Rutter, 1993), helped alleviate physical pain and distress (Taft et al., 1999). Interestingly, social support was also found to contribute to improved perceived health in sexual assault victims, providing a distinct link between resilience and buffered physical functioning following interpersonal trauma, and sexual trauma specifically (Taft et al., 1999).

A number of researchers have focused on the concept of "vitality," whether referred to as subjective vitality, emotional vitality or mental vitality (Richman et al., 2009; Steptoe et al., 2009; Tremblay et al., 2006). Generally, vitality can be defined as a combination of positive emotions that provide energy for managing negative emotions and effective problem solving (Richman et al., 2009). Others have described it as a sense of energy or "aliveness" (Tremblay et

al, 2006), such that there is a feeling of being in a restorative or regenerative state of being. Vitality has also been described as pep, life satisfaction, happiness, and emotional stability or security (Steptoe et al., 2009).

Vitality interrelates with both coping and emotional flexibility, and comprises much of what is referred to as the "biopsychospiritual drive" needed for positive outcome in the newest wave of resilience research (Richardson, 2002; Richman, et al., 2009; White, 2009). Vitality, in itself, has been linked to a wide range of health and psychological benefits, including decreased tension, depression, anger, fatigue, and confusion. It has also been significantly associated with decreased hypertension and hypercholesterolemia, and has been linked to decreased risk or cardiovascular disease in a number of studies (Richman et al., 2009; Steptoe et al., 2009). Vitality is associated with fewer chronic physical conditions, and is found in those who report high levels of perceived health, well-being, and overall life satisfaction, indicating that it is a large part of resilient outcome following traumatic distress (Richardson, 2002; Richman, et al., 2009).

It is important to note that there is some evidence that those who rated themselves as high in resilience, when measured as a construct itself, also reported significant levels of trauma-related psychological distress, though reported distress did not meet criteria for PTSD (White, 2009). This pattern is consistent with models from Bonanno (2004; 2010) and Connor and Davidson (2003) that describe resilience as a process that may take several different trajectories, some of which include recovery from traumatic distress over time. While resilience may be assumed to act as a buffer against trauma-related physical health problems, the variability in

pathways raises the questions regarding the risk for development of long-term physical health problems as part of that process.

Previously, researchers have associated resilience and related aspects of positive psychological functioning as contributors with better overall physical health in those who have experienced trauma. A strong empirical literature has identified such areas of positive functioning as contributing to better health outcomes in multiple populations (Anderson & Anderson, 2003). However, as previous studies have revealed that those who may be considered resilient are not without some experience of distress (White 2009), it is important to further investigate the role of resilience in long-term health outcomes following trauma.

Impact of Trauma Exposure and Traumatic Distress on Healthcare

The potential for trauma to exact negative effects on a number of domains of physical health holds significant implications for the impact of traumatic distress on health care delivery (Kendall-Tackett & Klest, 2008; Schnurr & Green, 2004; Solomon & Davidson, 1997). A growing body of empirical research indicates the presence of a connection between chronic stress resulting from trauma and many chronic and life-threatening diseases (Boscarino, 2008; Calhoun et al., 2009; Kendall-Tackett & Klest, 2008; Leserman & Drosman, 2007; Schnurr & Green, 2004). Although much of the interest surrounding traumatic events focuses on the negative psychological consequences, identifying what impact trauma has on the manifestation of physical illness may do much to alleviate the chronicity and distress associated with physical health problems (Campbell, 2002; Martin et al., 2008). Not only does the connection between mental and physical health speak to the extended benefits of psychotherapy (Pennebaker et al., 1988; Steptoe et al., 2009; Tremblay et al., 2006), it also highlights the necessity of better

insurance coverage for mental health treatment, particularly if such treatment could reduce overall healthcare costs related to psychological distress.

A large number of studies have identified a range of physical health disorders associated with chronic traumatic distress, including cardiovascular disease, cancer, hypertension, respiratory illness (e.g. asthma, Chronic Obsrtuctive Pulmonary Disease (COPD), emphysema), gastrointestinal disorders, diabetes, and chronic pain disorders (e.g. arthritis, fibromyalgia, migraine) (Hien et al., 2009; Kendall-Tackett & Klest, 2008; Leserman & Drossman, 2007; Schnurr & Green, 2004; Woods et al., 2005). Several studies have also found traumatic distress to be associated with increased risk for autoimmune disorders, including allergies, dermatitis, lupus, multiple sclerosis, and increased susceptibility to communicable diseases like cold and flu virus (Gill et al., 2009; Woods et al., 2005).

Although the range of trauma-related physical symptoms and disease processes impacts care in nearly every medical specialty (e.g. cardiovascular, gastroenterology, oncology, obstetrics and gynecology), primary care physicians are often the first line of contact for the majority of traumatized individuals (Haley et al., 1998; Krueger, Chentsova-Dutton, Markon, Goldberg, & Ormel, 2003; Martin et al., 2008; Ouimette, Wade, Prins, & Schohn, 2008; Schnurr & Green, 2004). As effects of chronic posttraumatic stress exact themselves on the body, the deleterious impact on the individual's stress response system increases the risk for a variety of health problems, including cardiovascular diseases, chronic pain disorders, and other autoimmune related disorders (Boscarino, 2008; Gill et al., 2009; Kendall-Tackett & Klest, 2008; Kendall-Tackett, 2009; Schnurr & Green, 2004). There may also be increased attention to physical symptoms and higher risk of impaired health status and daily functioning as a result of

chronic traumatic distress and attempts to cope through avoidance, dissociation, and/or negative health behaviors (Martin et al., 2006; Kendall-Tackett & Klest, 2008; Pennebaker, 2000). Overall, this increased risk for chronic health problems and impaired health status presents an array of challenges in terms of diagnosis and provision of appropriate care for primary care providers (Clouse & Sherif, 2008; Seng, 2011; Solomon & Davidson, 1997)

It is important to note the impact of traumatic distress on the frequency and nature of healthcare utilization, such that it presents an additional set of problems that may negatively impact the manner in which services are effectively provided. Previous traumatization has been significantly associated with an increased number of non-acute office visits across both trauma types and different primary care settings (Deykin et al., 2001; Hien et al., 2009; Suris & Lind, 2008). Alternatively, some researchers have noted that previously traumatized individuals may also be hesitant to utilize healthcare when it is necessary (Hien et al., 2009). This may be due to a number of factors, including fear and/or discomfort during physical exams (Hien et al., 2009). There may also be a lack of awareness of physical symptoms, whether due to avoidance, numbing, or dissociation (Pennebaker, 2000). These interferences in the effective provision of needed healthcare can negatively affect prognosis and treatment of serious medical disorders, as well as negatively impact the way the patient is perceived and treated during the healthcare seeking experience (Campbell, 2002; Deykin et al., 2001; Haley et al., 1998; Hien et al., 2009; Roth et al., 1997).

The diverse range of physical health problems that arise from traumatic distress indicates increased healthcare utilization at nearly every level of general service provision in primary care (Kendall-Tackett & Klest, 2008; Kendall-Tackett, 2009; Schnurr & Green, 2004). At the most

basic level, emergency (ER) departments are the first line of service for traumatized individuals, both in terms of acute care and primary care provision, as ERs have increasingly become the default primary care providers for the massively high numbers of uninsured patients (Campbell, 2002; Campbell & Lewandoski, 1997; Schnurr & Green, 2004; Tjaden & Thoennes, 1998; WHO, 2002). As such, many patients exhibiting the types of physical health problems associated with traumatic distress routinely present to the ER (Campbell, 2002; Campbell & Lewandoski, 1997; Schnurr & Green, 2004; Tjaden & Thoennes, 1998; WHO, 2002).

Primary care providers (PCP) in the community may be even more likely than acute and emergent care providers to come in contact with these aforementioned physical health problems (Campbell, 2002; Kendall-Tackett & Klest, 2008; Martin et al., 2008; Schnurr & Green, 2004). Particularly because most patients seek referrals to specialists (e.g. cardiology, gastroenterology, rheumatology) via their PCP (Martin et al., 2008; Schnurr & Green, 2004), such practices may see a large number of people presenting with a quite diverse range of trauma related health problems (Campbell, 2002; Haley et al., 1998; Martin et al., 2008; Schnurr & Green, 2004). It is important to note that the significant impact of traumatic distress on physical health presents an additional load to an already overburdened primary healthcare system (Kendall-Tackett & Klest, 2008; Schnurr & Green, 2004; Solomon & Davidson, 1997). However, clinical knowledge of the relation between trauma and related physical health problems is essential for a physician to have a comprehensive understanding of any given patient's symptomatic presentation. Not only does this sensitivity guide best evidence-based practices and treatments, it also communicates and facilitates care for the patient as a whole.

Primary healthcare provision for women faces an even larger challenge in its coverage of this particularly vulnerable population (Campbell, 2002; Campbell & Lewandoski, 1997; Eadie et al., 2008). As previously discussed, women experience a higher risk than men for the development of physical health problems following trauma, not only due to biological differences in the way their stress response system reacts, but also due to females' increased vulnerability to the types of interpersonal traumas that increase risk for health problems (Briere, 1992; Campbell, 2002; Deykin et al., 2001; Gill et al., 2009; Suris & Lind, 2008). Earlier studies have also shown that traumatized women seek primary care three times more than non-traumatized women (Campbell, 2002; Martin et al., 2008).

Though some women present primarily to a family practitioner, it is generally accepted that women receive the majority of their primary care from their OB/GYN (Clouse & Sherif, 2008; Deykin et al., 2001). As such, OB/GYN practices are presented with a number of additional patients and office visits they might not have in the absence of traumatic distress, of which women are at higher risk for developing following trauma (Brewin et al., 2000). Previous research has also revealed health problems unique to female populations and closely tied to sexual and reproductive health (Eadie et al., 2008; Gansill et al., 2012; Martin et al, 2008). Other studies utilizing female subjects have found several commonly reported symptoms in victims of interpersonal violence, including chronic pain, gastrointestinal problems, gynecological problems such as sexually-transmitted diseases, and depression (Campbell, 2002), which many women seek treatment for through their OB/GYN provider (Clouse & Sherif, 2003).

Several researchers have focused on the specific effect of interpersonal trauma on physical health problems, and have found a number of problems that present a unique risk to

gynecological populations (Campbell, 2002; Campbell & Lewandoski, 1997; Eadie et al., 2008; Hien et al., 2009; Martin et al., 2008; Suris & Lind, 2008. Although some symptoms may be direct effects of physical trauma as a function of the trauma itself (e.g. sexual assault leading to vaginal tearing), many of the others are chronic, long-standing gynecological complaints for which there is often no obvious organic cause (Campbell, 2002; Gansill et al., 2012; Hien et al., 2009; Martin et al., 2008). It is important to note, however, the majority of studies exploring the relation between trauma exposure and long-term physical health outcomes in women have largely neglected the consideration of non-interpersonal traumas in their impact on both psychological and physical functioning. A better understanding of the relation between exposure to a broad range of trauma events and current physical health presentations in gynecological populations would contribute greatly to improved provision of healthcare for women.

While there is a significant amount of empirical literature establishing the strong relation between trauma exposure and negative effects on physical health, findings have thus far been somewhat limited in their generalizability to the overall population. Previous studies using community, veteran, and female populations have consistently shown that those who have experienced one or more traumatic events in their lifetimes are at significantly greater risk for a wide range of chronic physical health problems (Felitti et al., 1998; Kendall-Tackett & Klest, 2008; Martin et al., 2008; Suris & Lind, 2008; Schnurr & Green, 2004). However, these studies have been limited in that their primary focus has been on that of risk outcomes for those who have developed PTSD, and have done little to explore variable response pathways, such as PSS and resilient responding, through which trauma negatively impacts physical health.

Other studies that have investigated particular trajectories (i.e. potentiating effects of PTSD, depression, immunosuppressant dysregulation) from trauma to physical health problems have focused more on specific populations with specific trauma histories (e.g. women with history of sexual or physical abuse, veterans with history of combat trauma, adolescents with accident injury) to explore the impact of other variables in predicting physical health problems following trauma exposure (Eadie et al., 2008; Gansill et al., 2012; King et al., 1998; Suris & Lind, 2008). These studies have also been limited in their ability to provide a more comprehensive understanding of the relation between trauma and health, particularly as sampling has been circumscribed to mostly specialized populations and findings have not been generalizable to heterogeneous community populations with a range of traumatic experiences (Eadie et al., 2008; King et al., 1998; Martin et al, 2008; Suris & Lind, 2008).

In addition, the majority of studies that have explored mediation of the relation between trauma exposure and physical health outcomes have examined the role of clinically-diagnosed PTSD as a mediating variable at least partially explaining the relation between trauma exposure and physical health problems (Kendall-Tackett & Klest, 2008; Schnurr & Green, 2004; Spitzer et al., 2009; Taft et al., 1999). Participants in these studies were diagnosed with PTSD using well-validated diagnostic measures (e.g. Clinician-Administered PTSD Scale (CAPS), Blake et al., 1995; PTSD Check List (PCL), Weathers, Litz, Herman, Huska, & Keane, 1993), and investigated separately from control groups that included no trauma, or trauma with no PTSD. However, these studies did not investigate subclinical levels of traumatic distress in their impact on the relation between trauma exposure and physical health outcomes, although an established literature has highlighted the significant differences in psychological response to trauma, particularly among women who have experienced chronic interpersonal trauma (Briere & Jordan,

2009; Campbell & Lewandoski, 1997; Martin et al., 2008; Roth et al., 1997; van der Kolk et al., 2005). Other studies that have begun to investigate the impact of a range of posttraumatic stress symptoms (PSS) on physical health have limited their investigation to circumscribed samples reporting specific trauma types (e.g. sexual assault, combat exposure) (Eadie et al., 2008; Wachen et al., 2013). Further, while significant attention has been focused on exploring variables that increase risk for physical health problems following trauma exposure, very little empirical research has investigated that factors that may reduce the risk for chronic health problems after traumatization. The few studies that have examined potential moderators in the relation between trauma exposure and physical health outcomes have investigated the impact of positive psychological characteristics singularly, rather than exploring a broader adaptive psychological process, such as the phenomenon of resilience (Frederickson, Tugade, Waugh, & Larkin, 2003; King et al., 1998; Matheson et al., 2008; Thompson et al., 2011; Yi et al., 2008).

More research is needed to better understand the complex relation between trauma exposure and physical health outcomes. In particular, specific investigation of the role of a range of PSS would add important information needed to more comprehensively understand the impact of a range of psychological distress on physical health following trauma exposure. It is also essential to have more empirical evidence regarding the role of resilience, a much-investigated adaptive process following trauma exposure that has been largely neglected in the literature exploring trauma exposure and physical health outcomes. Further investigation of the role of resilience in predicting physical health outcomes following trauma would provide crucial information regarding processes taken to reduce risk of negative health outcomes.

It would also be greatly beneficial to improve understanding of the complexity of women's physical and mental health as it relates to lifetime trauma exposure, particularly as female populations are significantly more vulnerable to trauma exposure and much more likely to report clinical levels of PTSD when compared to men exposed to the same traumas (Brewin et al., 2000; Briere & Jordan, 2004; 2009; Campbell, 2002; Eadie et al., 2008; Martin et al, 2008). Previous studies using female populations have been circumscribed to specific trauma types (e.g. sexual abuse/assault, intimate partner violence, though they have established a literature showing a wide range of chronic health problems following interpersonal trauma exposure in particular. More research is needed to further understand how women respond to a range of traumatic experiences, both in terms of variable traumatic distress and increased risk for chronic health problems not necessarily related to interpersonal trauma only.

Rationale

This project explored the link between trauma and physical health and expanded the existing literature investigating the increased risk for chronic physical health problems following trauma exposure. Specifically, this study investigated the relation between trauma exposure and physical health in a sample of women seeking obstetrical/gynecological (OB/GYN) care at a private clinic, and examined traumatic distress (e.g., PSS) as a possible mediator potentiating the impact of trauma exposure on frequency of commonly reported somatic symptoms and associated functional impairment (i.e. somatic malaise), and healthcare utilization. This study also investigated the role of resilience as a potential moderator in the relation between trauma and physical health, exploring whether resilience affects the impact of trauma exposure on somatic malaise and healthcare utilization. It further examines the role of resilience, as a

moderator in the relation between trauma exposure and traumatic distress, exploring whether resilience impacts the effect of trauma exposure on trauma-related psychological distress.

Much of the existing research that has examined the effect of traumatic stress has employed older male subjects, primarily veterans receiving primary care through the VA system. Given strong evidence that women are more often exposed to trauma, and are more likely to be diagnosed with PTSD and other trauma related symptoms following trauma exposure compared to men, a female population was deemed best to investigate the physical health impact of trauma exposure. Although several studies have examined the effects of trauma on women and ethnic minorities, more research is needed to establish a body of research examining the health impact of trauma among these populations. To employ a sample of women, diverse in age, ethnicity, and socioeconomic background, who presented to a large OB/GYN practice was deemed especially appropriate as many women present to their OB/GYN for primary care and psychological counseling as well as for gynecological problems (Campbell & Lewandoski, 1997; Eadie et al., 2008; Martin et al., 2008). This type of sample allows information to be gathered on a wide range of general, gynecological, and psychological health symptoms to determine their relation to prior trauma. Sampling a population within a private OB/GYN practice limits recruitment to participants who are already utilizing health services, thereby constraining interpretations of utilization to those women seeking OB/GYN at a private practice. However, sampling such a population is an important first step in exploring how trauma exposure, traumatic distress, and resilience affect help-seeking behaviors in women who utilize specialty health services.

Another important aspect of this study is the examination of resilience and its role in the development or prevention of physical health problems following trauma. Many theorists have

conceptualized resilience as a buffer against the deleterious impact of negative life experiences (Bonanno, 2004; Connor, 2006; Luthar, 1991; Rutter, 1985). Little is known about the relation between resilience and physical health, as research has primarily focused thus far on the psychological, social, and behavioral effects of resilience. One may hypothesize that resilience acts as a buffer against the development of health problems. However, since recent research has shown that resilient people are not necessarily without psychological distress (White, 2009), they may also be vulnerable to trauma's impact on their physical health.

Although current theoretical models of the relation between trauma and health problems conceptualize PTSD as a necessary mediator for the development of health problems (Chaudieu et al., 2011; Eadie et al., 2008; Friedman & McEwen, 2004; Schnurr & Green, 2004), the variability of levels of distress following trauma (Yehuda, 2006) may speak to the possibility that physical problems may also arise in those with symptomatic distress that is sub-threshold for a PTSD diagnosis (e.g., PSS). Previous studies that have restricted empirical investigations of the relation between trauma exposure and physical health to those with clinical diagnoses of PTSD may limit the breadth of findings. It is important to consider the full range of both psychological and physical health functioning in those who been exposed to trauma to more comprehensively understand the relation between traumatization and physical health. This study aimed to further elucidate connections between psychological distress and physical health by examining the impact of two variables, psychological symptoms of post-traumatic distress and resilience, in women who have experienced a range of traumatic events to determine the effect each path has on the development of physical health problems.

Hypotheses

In order to explore the relations among trauma exposure, traumatic distress, resilience, and physical health outcomes, I made the following hypotheses. I predicted that trauma exposure would contribute significant variance to the prediction of physical health outcomes (i.e. somatic malaise and healthcare utilization) (Hypothesis 1). This prediction is consistent with current polyvictimization literature regarding the relation between trauma exposure rates and severity of trauma-related outcomes (Elliott et al., 2009; Finkelhor et al., 2009; Hickman et al., 2013).

I also predicted that trauma exposure would contribute significant variance to the prediction of traumatic distress above and beyond that of contributing demographic factors (Elliott et al., 2009; Finkelhor, 2012; Hickman et al., 2013) (Hypothesis 2a). I predicted further that traumatic distress would contribute a significant amount of variance to the prediction of physical health outcomes (Hypothesis 2b). Moreover, I predicted that the variance contributed by traumatic distress would enhance prediction of physical health outcomes following trauma exposure, such that variance in physical health outcomes is significantly more explained with the addition of traumatic distress (Kendall-Tackett & Klest, 2008; Schnurr & Green, 2004) (Hypothesis 2c). These results would indicate that traumatic distress accounts for significantly more predictive variance in the relation between trauma exposure and physical health outcomes than the variance contributed by trauma exposure and demographic factors alone. These findings would also extend the current literature to show that a range of subclinical traumatic distress (e.g, PSS) may enhance the effect of trauma exposure on physical health outcomes.

Next, I predicted that resilience would contribute a significant amount of variance to the prediction of physical health outcomes (i.e. somatic malaise and healthcare utilization), and that

the interaction of resilience with trauma exposure would enhance the prediction of health outcomes above and beyond that variance explained by trauma history (Hypothesis 3). These results would indicate that the effects of trauma exposure on physical health outcomes vary as a function of resilience. This prediction is consistent with existing literature that shows factors conceptualized as contributing to resilience to be associated with better health outcomes (Frederickson et al., 2003; Matheson et al., 2008; McIntosh et al., 2011; Richman et al., 2009), and would significantly add to the current resilience literature in showing that the construct, when conceptually measured, contributes to physical health outcomes following trauma.

Finally, I predicted that resilience would contribute a significant amount of variance to the prediction of traumatic distress, and that the interaction of resilience with trauma exposure would account for significantly more variance in traumatic distress that that contributed by trauma exposure alone (Hypothesis 4). These results would indicate that the effects of trauma exposure on traumatic distress vary as a function of resilience. Such findings would be consistent with a rich literature regarding resilience as a construct reflecting adaptive functioning following trauma and/or adversity (Bonanno et al., 2010; Connor & Davidson, 2003; Lepore & Revenson, 2006; Luthar & Ziglar, 1991; Rutter, 1993), such that it would contribute to the prediction of lower traumatic distress despite the effects of trauma exposure itself. The hypothesized relations among the primary factors of interest in the proposed predictive model are displayed in Figure 1.

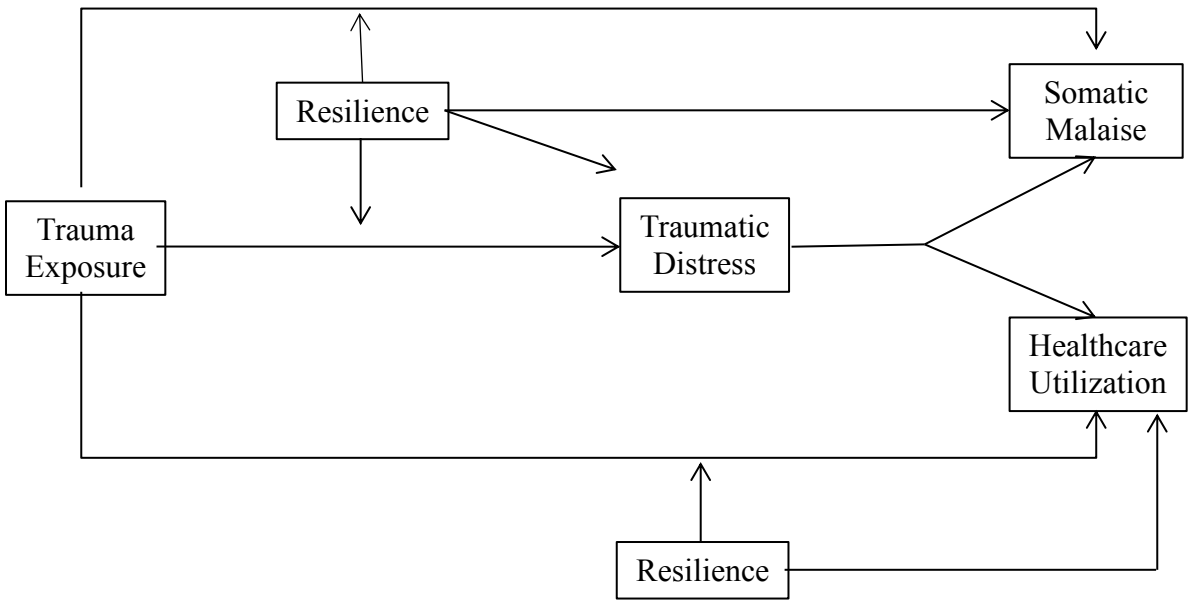

Figure 1. Hypothesized Relations Among Variables in the Proposed Predictive Model. This figure illustrates hypothesized relations among the primary variables of interest in this study, with arrows between variables indicating significant predictive relations.

Methods

Participants

This study utilized 206 female participants, all of whom presented to a large OB/GYN practice in East Alabama, Lee Obstetrics and Gynecology, P.A. The overall OB/GYN population solicited for study participation was diverse in age, ethnicity, socioeconomic status, and health status. No exclusions were made for pregnant participants. Inclusion required that participants be at least 18 years of age. Participants were recruited at the time of their visit, regardless of their presenting problem. Participants were entered in a drawing for monetary compensation for their time and participation in the study.

Measures

Material presented to the participants included consent forms and a questionnaire packet including Demographic Information (Appendix A); a modified measure of health conditions and risk behaviors, the Behavioral Risk Factor Surveillance System (CDC, 2011) (Appendix A), used to assess health status and self-reported general daily functioning; the Pennebaker Inventory of Limbic Languidness (PILL, Pennebaker, 1982) (Appendix A), used to assess frequency of reported common somatic symptoms; the Initial Trauma Review (ITR-R) (Briere, 2004) (Appendix A), to assess child and adult trauma history; the Adverse Childhood Experiences questionnaire (ACE, Felitti & Anda, 2009) (Appendix A), included to assess additional childhood adversities not assessed in the ITR-R; the Connor-Davidson Resilience Scale (CD-RISC) (Connor & Davidson, 2003) (Appendix A), used to assess factors of adaptive functioning contributing to overall resilience; and the Trauma Symptom Inventory (TSI) (Briere, 1995) (Appendix A), to assess self-reported experience of trauma-related psychological symptoms.

Data regarding health care utilization (Patient Chart Review) were gathered through a medical chart review of visits to the clinic in the previous year. Information was gathered on number of visits in the past year, level of service provided, and physician diagnoses.

Consent Forms. Participants were provided with a consent form (Appendix A) that briefly described the purpose of the study along with potential risks and benefits. It explained that participation was voluntary and that the participant could choose to discontinue at any time. Signature of this consent form included permission for the primary investigator to enter the participant's patient chart to gather information on visits in the past year. Participants were asked to provide their patient identification number or name and date of birth to both identify their medical record with their consent and enter them in a drawing for reward compensation. The consent form explained confidentiality, assured participants that all responses would remain anonymous, and guaranteed that any personal and electronic identifiers connecting them to their private health information would be removed from the database immediately following data collection from patient charts.

Demographic Information. The first part of the questionnaire assessed the demographic background of the participants in this study. Data was gathered on age, ethnicity, marital status, education, employment, and income. Information was also gathered regarding the number of children and number of total persons living in the participants' household (Appendix A).

Behavioral Risk Factor Surveillance System-Modified (BRFSS). The Behavioral Risk Factor Surveillance System (BRFSS) is a system of health surveys that collects information on health risk behaviors, preventive health practices, and health care access related to chronic disease and injury. Different states use data from the BRFSS to explore emerging health

problems, set and monitor health objectives, and develop public health policies and programs, as well as health-related legislative efforts (CDC, 2011).

This study used a modified version of the BRFSS utilizing survey questions that had been used in 2011 in the state of Alabama, the site of participant recruitment. Fifteen questions were chosen for inclusion based on their relevance to the purposes of this study. Items included pertained to quality of life, health perceptions, health care access, and preventive health practices. Questions were scored on a 5-point Likert-rating scale. Questions were summed to yield a total score. Item content included perceptions of overall physical and mental health problems, restriction from daily activities, lack of preventive health behaviors, lack of perceived support, and overall life (dis)satisfaction. There were ten items that assessed overall lifetime health status, while five items focused on specific health behaviors over the past month. Items in the above content areas were totaled separately, then combined to yield a Health Status score, with higher scores reflecting poorer health status.

Pennebaker Inventory of Limbic Languidness (PILL). The Pennebaker Inventory of Limbic Languidness (Pennebaker, 1982) is a 54-item scale that assesses people's tendency to notice and report common physical symptoms and sensations. The PILL Total Score is calculated by summing participants' reports of the frequency of each of these problems using a Likert-type scale ranging from 0 (never or almost never) to 5 (more than once every week). Internal consistency and reliability on the PILL is quite high (.88-.91), with a high retest reliability as well (.79 - .83)

Initial Trauma Review-Revised (ITR-R). The Initial Trauma Review, Revised (Briere, 2004) is a 15-item behaviorally-anchored questionnaire that allows for the assessment and evaluation most major forms of trauma exposure. Items are divided into childhood and

adulthood events. It also inquires about subjective distress in response to these traumas, as required by DSM-IV's A2 criteria for PTSD and Acute Stress Disorder (ASD). Endorsement of exposure, fear/horror, helplessness, and imminent threat to self are each scored for a total ITR-R score. Endorsement of incident exposure only was totaled separately to yield a trauma exposure total to be used in this study. This measure is an unpublished test provided by Briere & Scott (2006), and its use is limited to clinicians and researchers who are permitted to modify the items as deemed relevant. Validity and reliability scores were not provided for this measure by the developers.

Adverse Childhood Experiences Questionnaire (ACE). The Adverse Childhood Experiences (ACE) study is an ongoing collaborative study between the Centers for Disease Control and Prevention and Kaiser Permanente's Health Appraisal Clinic. The ACE study is one of the largest investigations to study the associations between childhood maltreatment and later-life health and well-being (Felitti et al., 1998; Felitti & Anda, 2009). This study utilized the 10-item ACE score calculator used in the ACE study to assess for the incidence of a range of childhood interpersonal traumas in the categories of abuse, neglect, and household dysfunction (Felitti et al., 1998). Total scores were obtained by summing the items endorsed. The questionnaire was developed using items from other published surveys, including the Conflict Tactics Scale (Straus & Gelles, 1990) and the 1988 National Health Interview Survey (cf. Felitti et al., 1998). The authors did not provide validity and reliability statistics for the ACE score calculator, referring to the content's prior use in well-validated and reliable measures.

Connor-Davidson Resilience Scale (CD-RISC). The Connor-Davidson Resilience Scale (CD-RISC) is used to identify coping methods and cognitive approaches used by trauma-exposed individuals to adapt following trauma (Connor & Davidson, 2003). The scale is

comprised of 25 items, each rated on a 5-point Likert scale. The 25 items also comprised 5 factors that were broadly interpreted by the developers of the scale as follows: Factor 1 reflects personal competence, tenacity, and high standards, Factor 2 is associated with trust in instinct, tolerance of negative affect, and strengthening effects of stress, and Factor 3 corresponds to positive acceptance of change and secure relationships. Factor 4 was associated with control, while Factor 5 reflected spiritual influences (Connor & Davidson, 2003). Scores from each item were summed to yield an overall resilience score. Higher scores reflect greater resilience. The scale was developed with the recognition that it is possible to be resilient in one area, and struggle with the effects of adversity in other areas, and individuals may use different coping methods more or less frequently than others as they adjust to effects of trauma. Reliability coefficients were high in clinical trials (0.87), as were levels of convergent validity when compared with other measures of resiliency factors (e.g. hardiness, perceived stress, stress vulnerability, disability, social support) (Connor & Davidson, 2003).

Trauma Symptom Inventory (TSI). The Trauma Symptom Inventory (TSI) (Briere, 1995) is a 100-question survey used to assess current levels of symptomology following a traumatic event. Each item is assessed on a 4-point Likert scale according to frequency of experience in the past 6 months (i.e. 0 = Never and 3 = Often). The measure was designed to evaluate post-traumatic stress, the long-term effects of child sexual abuse, and the psychological consequences of the experience of trauma. The TSI is divided into the following scales: anxious arousal, depression, anger/irritability, intrusive experiences, defensive avoidance, dissociation, sexual concerns, dysfunctional sexual behavior, impaired self-reference, and tension reduction behavior. For each of these scales, a T-score ≥ 65 is considered clinically significant. Additionally, the T-scores on each scale may be used to calculate an overall score to compare to

an overall standard sample. Briere (1995) suggests using each of these 10 scales separately in clinical practice to assist in forming a more detailed, complete conceptualization for more complex traumatic response presentations. Exploratory factor analysis yielded two factors (i.e. "Generalized Trauma" and "Self Dysfunction") that Briere suggested may be used in research to better understand the variance in symptomatic distress and personality functioning as contributed by different clinical scales. Briere (1995) also conducted a confirmatory factor analysis that revealed the presence of three factors thought to better represent current trauma theory (i.e. "Trauma", "Dysphoria", and "Self"), suggesting the benefits of using a 3-factor model to best understand results in the context of trauma theory. Internal reliability for the TSI has proven to be high (0.74 – 0.91) in clinical trials. Levels of convergent and discriminant validity (Briere, 1995) have also been high.

Patient Chart Review. The primary investigator conducted a chart review for participants who provided their patient identification number as their electronic signature to consent to gather additional healthcare utilization data. Participants who did not know their patient identification number provided other identifying information that was then matched to their patient identification number for chart review, then removed from the database. The number of office visits in the past year was counted, as well as the number of physician provided ICD-9 diagnoses. Each office visit was assigned a weight according to the CPT procedure code used to bill for the visit (e.g. simple problem focused/annual visit = 1, problem focused/annual visit with problem = 2, expanded problem focused and prenatal care = 3, detailed problem focused and high-risk prenatal care = 4, in-office procedure = 5, surgery = 6). The weights assigned to each visit were summed and averaged for an overall CPT score. Additional information was gathered on the number of past medical history diagnoses.

Procedure

Office personnel (e.g. administrative staff, nurses, and physicians) recruited participants at the time of their office visit. Additionally, informational flyers were posted in common areas of the office to recruit additional participants. The primary investigator also recruited participants in-person at the time of their visit. The data collection phase of this study began in July 2011 and was completed in May 2012. If interested, participants were provided their office chart number to use to give consent for the primary investigator to enter their patient chart, as well as register their questionnaire responses for a subsequent drawing for monetary reward.

Interested participants were offered two options for questionnaire completion: (1) pencil and paper questionnaire provided to complete while waiting in the office, or (2) directions to complete the questionnaire online at their convenience. Participants who completed the survey online (N = 123) used the online data collection engine Survey Monkey. The informed consent form was presented first, followed by the additional questionnaires. Participant privacy and confidentiality were directly ensured due to the controls of the Survey Monkey program. Answers from the hard copy questionnaires were entered into Survey Monkey manually by the primary investigator. Upon completion, each participant's survey response was downloaded directly into the SPSS database for further analysis. The primary investigator then conducted a chart review from participant-submitted chart numbers to collect data on the number of office visits, diagnoses, and level of care provided during the previous year. Patient identification was then removed and chart data were combined with data from the questionnaire on Survey Monkey.

Results

Demographics

Two hundred and six women from a community sample participated in this study. The mean age of this sample was 39.5 years (SD = 14.25), with reported ages ranging from 18 to 77. With 73.3% non-Hispanic Caucasian participants (n = 151), ethnic group representation was as follows: 21.8% African American, 1.9% Hispanic/Latino, 1.4% Asian American, and 1% other not specified. Participants' interpersonal relationship status indicate most were married (72.3%, n = 149), while 13.6% were single/never married, 5.3% were partnered in an unmarried couple, 1% were widowed, 2.4% were separated, and 5.3% of participants were divorced. This sample's participants were married at a significantly higher rate as compared to the 2011 U.S. Census American Community Survey that reported, within Alabama's surveyed population, 47.8% were married. The number of people living in these participants' home was relatively low, where 71.4 % (n = 147) reported 3 or fewer people in the home, including themselves, while 4.4% (n = 9) indicated 6 or more people living in the home. Educationally the group was fairly well-educated, with 84.5% (n = 174) of participants having completed some college, and 29.1% (n = 60) completing postgraduate or professional training. When compared to 2011 Alabama census data (U.S. Census, 2011 American Community Survey), the number of participants reporting some college education was similar, with 81.9% of Alabama's population reporting high school education or higher. There were significantly more highly-educated participants in this sample, with just 7.7% of Alabama's surveyed population completing post-graduate or professional training (U.S. Census, 2011 American Community Survey). The remainder of the sample's education background is as follows: .5% never attended school, 1% attended grades 1-8, 1% attended some high school, and 12.6% of participants graduated from high school or completed

their GED with no post-secondary education. Occupational data showed that 76.7% (n = 158) of the sample was employed full- or part-time, while 3.3% (n = 7) were unable to work. Income varied, with 35.9% of the participants reporting a yearly household income of $75,000 or more, 35.4% reporting between $35,000 and $75,000 yearly income, and 26.7% reporting making less than $35,000 in yearly income (see Appendix B).

Descriptive Statistics

Trauma exposure. Table 1 displays the prevalence of trauma exposure in this community female sample. Participants' trauma history based on the ITR-R (Briere, 2004) and ACE scores (Felitti & Anda, 2009) indicated 77.7% (n = 160) of the participants reported at least one traumatic event in their lifetime. A substantial number experienced more than one traumatic event, with 47.7% of the participants reporting between 2 and 6 traumatic events, 5.7% reporting between 7 and 9 traumas, and 4.7% reporting 10 or more traumatic events in their lifetime. Participants endorsed variable experience of traumatic events that may occur during childhood and adulthood. A majority of participants (35.0%, n = 72) reported both childhood and adulthood traumas. A similarly large portion of the sample reported experiencing trauma only in childhood (34.0%, n = 70), while 8.7% (n = 18) reported experiencing traumatic events in adulthood only. Overall, the prevalence of lifetime traumatic events reported in this sample is comparable to statistics reported in previous large-scale epidemiological studies (Jankowski, 2003; Kessler et al., 1995; Tjaaden & Thoennes, 1998).

Table 2 displays frequencies for exposure to childhood traumatic events. In terms of childhood trauma exposure, 68.9% (n = 142) of this sample reported experiencing at least one traumatic event in childhood. The most frequently reported childhood traumas were parental separation/divorce (47.9%, n = 68), emotional neglect (38.0%, n = 54)), and familial substance

Table 1. Prevalence of Lifetime Trauma Exposure in a Female Community Sample (N = 206)

Number of traumas	N	Percentage
No traumatic events	46	22.3%
At least one traumatic event	160	77.6%
1	38	18.2%
2	26	12.4%
3	21	10.0%
4	23	11.0%
5	17	8.1%
6	13	6.2%
7	4	1.9%
8	3	1.4%
9	5	2.4%
10	3	1.4%
11	4	1.9%
12	1	.5%
14	2	1.0%

Table 2. Prevalence of Childhood Traumatic Events Experienced in a Female Community Sample (n = 142)

Type of event	N	Percentage of Subset (n = 142)	Percentage of Total Sample (N = 206)
Physical abuse	34	23.9%	16.3%
Sexual abuse	39	27.5%	18.7%
Child sexual behavior (victim)	13	9.2%	6.2%
Psychological abuse	44	31.0%	21.4%
Emotional neglect	54	38.0%	25.8%
Physical neglect	10	7.0%	4.8%
Parental separation/divorce	68	47.9%	32.5%
Domestic violence	16	11.3%	7.7%
Familial substance abuse	50	35.2%	23.9%
Familial mental illness	42	29.6%	20.1%
Familial incarceration	10	7.0%	4.8%
Natural disaster	14	9.9%	6.7%
Auto accident	25	17.6%	12.0%
Witness death/serious injury	28	19.7%	13.4%

Note. Percentage amounts total over 100 due to participants being able to endorse more than 1 trauma occurrence over lifetime.

abuse (35.2%, n = 50), while the least reported traumas were physical neglect and familial incarceration (7.0%, n = 10 for both). A wide range of frequencies was reported for a number of other childhood traumas and adversities. A recently updated ACE study conducted by the CDC (2010), which surveyed five states using the ACE module of the BRFSS, reported 59.4% of respondents had at least one adverse childhood event, suggesting that this community sample of female participants reported significantly higher rates of childhood trauma.

Table 3 displays frequencies for reported adult trauma events. In this female community sample, 43.7% (n = 90) reported at least one traumatic exposure as an adult. The most frequently reported adult trauma in this sample was intimate partner violence,
with 41.1% of those indicating adulthood trauma exposure reporting physical assault by a spouse or sexual partner (n = 37). The least reported adulthood traumas in the total sample were political torture and police assault (.5%, n =1, respectively).

Within the total sample of female community participants, 34.4% (n = 72) reported experiencing traumatic events in both childhood and adulthood (Table 4). The most frequently endorsed childhood traumatic events in this subset were parental separation/divorce (47.2%, n = 34), emotional neglect (37.5%, n = 27), and psychological abuse (36.1%, n = 26). The least reported child trauma events in this group were physical neglect and familial incarceration (9.7%, n = 7). The most reported adult event in this group was intimate partner violence, where 24.7% (n = 23) reported physical assault by an intimate partner and 9.7% (n = 9) reported severe homicidal assault by a spouse or sexual partner. The least frequently reported adulthood traumas in this subset were military combat, political torture, and police assault (all 1.1%, n = 1).

Table 3. Prevalence of Adulthood Traumatic Events (ITR-R) Experienced in a Female Community Sample (n = 90)

Type of event	N	Percentage of Subset (n = 90)	Percentage of Total Sample (N = 206)
Sexual assault	22	24.4%	10.7%
IPV – Assault	37	41.1%	18.0%
IPV – Severe homicidal assault	13	14.4%	6.3%
Physical assault	11	12.2%	5.3%
Military combat	2	2.2%	1.0%
Auto accident	28	31.1%	13.6%
Natural disaster	22	24.4%	10.7%
Political torture	1	1.1%	.5%
Police assault	1	1.1%	.5%
Witness death/serious injury	24	26.7%	11.7%

Note. Percentage amounts total over 100 due to participants being able to endorse more than 1 trauma occurrence over lifetime.

Table 4. Prevalence of Traumatic Events in Those Reporting Both Adulthood and Childhood Exposure (n = 72)

Type of event	N	Percentage of Subset (n = 72)	Percentage of Total Sample (N = 206)
Child physical abuse	20	27.8%	9.7%
Child sexual abuse	21	29.2%	10.2%
Child sexual behavior (victim)	9	12.5%	4.4%
Natural disaster (child)	8	11.1%	3.9%
Auto accident (child)	15	20.8%	7.3%
Witness death/serious injury (child)	18	25.0%	8.7%
Psychological abuse	26	36.1%	12.6%
Emotional neglect	27	37.5%	13.1%
Physical neglect	7	9.7%	3.4%
Parental separation/divorce	34	47.2%	16.5%
Domestic violence	11	15.3%	5.3%
Familial substance abuse	25	34.7%	12.1%
Familial mental illness	24	33.3%	11.7%
Familial incarceration	7	9.7%	3.4%
Sexual assault	13	18.1%	6.3%

Type of event	N	Percentage of Subset (n = 72)	Percentage of Total Sample (N = 206)
IPV – Assault	23	31,9%	11.2%
IPV – Severe homicidal assault	9	12.5%	4.4%
Physical assault	10	13.9%	4.9%
Military combat	1	1.4%	.5%
Auto accident (adult)	19	26.4%	9.2%
Natural disaster (adult)	15	20.8%	7.3%
Political torture	1	1.4%	.5%
Police assault	1	1.4%	.5%
Witness death/serious injury (adult)	16	22.2%	7.8%

Note. Percentage amounts total over 100 due to participants being able to endorse more than 1 trauma occurrence over lifetime.

When looking at trends of polyvictimization in this sample, particular attention was paid to sexual and intimate partner violence based on previous studies that have found significant trends both in terms of the prevalence of violence against women, as well as strong relations between previous interpersonal victimization and a wide range of chronic health problems (Briere & Jordan, 2009; Campbell, 2002; Martin et al., 2008). Prior research has also consistently shown a high risk of revictimization among those who have experienced interpersonal, particularly sexual, violence in their lifetimes (Breslau et al., 2008; Elliott et al., 2009; Finkelhor et al., 2009; Foa et al., 1995; Walsh, Blaustein, Knight, Spinnazola, & van der Kolk, 2007). In this study, focus was placed on those participants reporting childhood sexual abuse, sexual assault, and intimate partner violence.

Of the 206 total participants, 18.9% (n = 39) reported being sexually abused during childhood. This group also reported a wide range of additional childhood traumas as well as subsequent adulthood victimization (Appendix C, Table 1). Among those reporting childhood sexual abuse, the most frequently reported additional childhood traumas were parental separation/divorce (51.3%, n = 20), emotional neglect (48.7%, n = 19), psychological abuse (35.9%, n = 14), and familial substance abuse (35.9%, n = 14). The most reported adulthood event for those endorsing childhood sexual abuse was intimate partner violence, with 28.2% of the subset (n = 11) reporting physical assault by an intimate partner, and 15.4% (n = 6) reporting severe homicidal assault within an intimate relationship.

Within the total sample, 10.7% (n = 22) of the participants reported being sexually assaulted since the age of 18. For those 10.7% who had been sexually assaulted in adulthood, 81.8% experienced rape with penetration, where 72.7% of the perpetrators were a dating or intimate partner. IPV was also present in this group, where 45.5% of the participants who

endorsed sexual assault also reported intimate partner assault, and 18.2% indicated severe homicidal assault by an intimate partner. Participants who reported adult sexual assault also reported childhood psychological abuse (40.9%), childhood physical abuse (27.3%), and childhood sexual abuse (31.8%), as well as high rates of childhood emotional neglect (36.4%), parental separation/divorce (45.5%), familial substance abuse (45.5%), and family mental illness (40.9%). Other lifetime traumatic events within this group are listed in Appendix C, Table 2.

Of the total sample, 18.4% (n = 38) of the participants reported experiencing intimate partner violence at some point during adulthood, with 34.2% of this subset (n = 13) indicating severe homicidal assault by their partner. Additionally, 26.3% (n = 18) of this group reported being sexually assaulted (more than 24% (n = 16) by an intimate partner). In terms of childhood trauma exposure, the most reported child trauma event was parental separation/divorce (42.1%, n = 16), with 34.2% (n = 13) of this subset reporting psychological abuse, and 31.6% (n = 12) reporting emotional neglect and sexual abuse, respectively. See Appendix C, Table 3 in for additional polyvictimization rates for this group.

Exploration of polyvictimization trends in this sample revealed that those indicating sexual and intimate partner violence at some point in their lifetime reported similar rates of parental divorce/separation, familial substance abuse, and emotional neglect, but also indicated higher rates of childhood physical and psychological abuse when compared to the sample as a whole. In terms of adult trauma exposure, these groups reported significantly higher rates of homicidal intimate partner violence, particularly among those indicating physical assault by an intimate partner. Overall, it appears that those participants indicating sexual or physical interpersonal violence were significantly more likely to experience additional incidences of

interpersonal violence across their lifetimes than those reporting non-interpersonal traumatic experiences.

Variable Construction for Primary Analyses

Planned analyses consisted of multiple hierarchical regressions to determine the predictive value of traumatic distress and resilience on the development of health problems following trauma exposure. Data gathered from the measures completed in this study were used to create the main composite variables of interest for statistical analysis. The variables created were Trauma Total (IV), Somatic Malaise (DV1), Healthcare Behaviors/Utilization (DV2), Traumatic Distress (mediator), and Resilience (moderator).

Independent variable. Trauma Total, the primary independent variable, was based on the sum of the total number of traumatic experiences endorsed in the ITR-R (Briere, 2004) and total from the ACE score calculator, with three exceptions. Due to item overlap on the ACE and ITR-R for two items, those who endorsed sexual and/or physical abuse in childhood on both the ITR-R and ACE score calculator received a single count for those items. Also, items assessing responses of fear/horror, helplessness, and fear of imminent threat to self from the ITR were not included in the Trauma Total, as they involved one's reaction to an event at the time of its occurrence not an event per se. Preliminary statistical analyses revealed that participants' report of trauma incidence was significantly skewed in the positive direction ($\gamma = 1.304$, SE = .168). Due to data not meeting assumptions of normal distribution necessary for parametric statistical analyses, this variable was transformed using a square root operation to create a more normally distributed variable (Trauma Total_sqrt). This operation normalized the data and the positive skew was reduced ($\gamma = .018$, SE = .168).

Dependent variables. To create the two dependent variables, Somatic Malaise and Healthcare Behaviors/Utilization, several preliminary analyses were conducted to determine how best to utilize the data from the outcome measures: Modified BRFSS, PILL, number of physician visits and diagnoses in past year, number of medical history diagnoses, and CPTavg/level of care provided as determined by CPT codes (Pallant, 2010).

First, a confirmatory factor analysis was conducted on data from the PILL. The results indicated that 49 of 54 of the items were statistically related, as experienced on a more chronic basis (e.g., congested nose, upset stomach, sore muscles). However, five items were excluded from this factor as not fitting statistically with the rest of the items on the measure. Upon closer examination, it was apparent that the content of the excluded items represented more discretely experienced somatic symptoms (e.g. bleeding nose, reaction insect bite, sunburn). Due to lack of conceptual and statistical fit, a new variable, PILLdistress, was created that included 49 items of the 54, which represented a more chronic experience of somatic distress.

Next, a confirmatory factor analysis was conducted using data from the BRFSS Health Status, PILLdistress, and participants' medical records, including the number of visits in the past year, level of care, physician diagnoses, and medical history diagnoses. Factor analysis indicated the presence of two statistically and conceptually identifiable factors. Data from the factor analysis are displayed in Appendix D.

The six outcome variables were examined through principal components analysis using SPSS version 20. Prior to this analysis, however, the suitability of the data for factor analysis was assessed. The correlation matrix of the outcome variables indicated several coefficients of .3 and higher. (see Appendix D) The Kaiser-Meyer-Olkin (KMO) value was .632, exceeding the

recommended .6 value (Pallant, 2010). Bartlett's Test of Sphericity also met statistical significance, providing further support for factor analysis (Pallant, 2010).

Principal components analysis indicated the presence of two components with eigenvalues exceeding 1. Investigation of the screeplot showed a break after the second component, and further supported the use of two components for further investigation. The two-component solution accounted for 65.1% of total variance, with Component 1 contributing 38.3% and Component 2 contributing 26.8%. An oblimin rotation with Kaiser normalization was performed to aid in interpretation of these two components, and the rotated solution indicated a simple structure, with each component revealing strong loadings and with outcome variables loading substantially on only one component (Pallant, 2010). The exception was medhx, which was not found to load significantly on either component 1 or 2, and was therefore discarded from inclusion in the two resulting factors. There was a weak positive correlation between the two factors (r = .096).

Scores from the PILLdistress and Health Status variables were significantly related based on factor analysis and correlational tests (r = .53). This provided support for a composite variable consisting of the two measures. Results of the factor analysis showing Health Status and PILLdistress as loading on the same factor, along with a large correlational effect size between the variables, suggested that an average of the two for a composite variable would best represent a measure of reported somatic distress and functional impairment, or Somatic Malaise (Appendix D, Table 1) (Pallant, 2010).

The second component revealed by confirmatory factor analysis a consisting of number of visits, level of care (CPTavg), and number of physician diagnoses (Appendix D, Table 2). The number of medical history diagnoses was not found to be a good statistical fit within this

second factor, nor in the factor consisting of Health Status and PILLdistress, and was therefore discarded as an outcome measure. The remaining variables (i.e. visits, CPTavg, and physician diagnoses) were averaged, due to their similar range and mean scores, to create the second dependent variable, Healthcare Behaviors/Utilization.

Mediating variable. Data from the TSI were used to create the hypothesized mediating dependent variable Traumatic Distress. Although confirmatory factor analysis (Briere, 1995) indicated that the 10 scales yielded 3 factors: Dysphoria, Trauma, and Self, factor analysis of TSI data in the present sample resulted in a different pattern of scales when factor analysis was set to yield three factors, compared to those suggested by Briere (1995). Dysphoria included anxious arousal, depression, anger/irritability, dissociation, and impaired self-reference. This contrasts with Briere's (1995) Dysphoria subscale composition of anxious arousal, depression, and anger/irritability alone. Trauma in the present sample was comprised of subscales of impaired self-reference, intrusive experience, defensive avoidance, and sexual concerns. This contrasts with Briere's (1995) Trauma subscales of impaired self-reference, intrusive experiences, defensive avoidance, and dissociation. The Self factor in the present study consisted of subscales of sexual concerns, dysfunctional sexual behavior, and tension reducing behavior. This contrasts with Briere's (1995) Self factor subscales of sexual concerns, dysfunctional sexual behavior, tension reducing behavior, and anger/irritability. The CFA results for this sample are not only inconsistent with Briere's factor structure, they provide a poor conceptual match for the three factor solution of Trauma, Dysphoria, and Self.

Additionally, several of the clinical scales had problems with skewness, kurtosis, and internal reliability (i.e. depression, dissociation, sexual concerns, dysfunctional sexual behavior, and tension reducing behavior) (Appendix E, Table 1). It was also noted that the clinical scales

were highly intercorrelated (Appendix E, Table 2). Due to these problems, it was determined that a single composite score would best represent the measure of traumatic distress rather than a three-factor solution. The T-scores from each of the 10 clinical subscale scores were then summed and averaged to create an overall TSI mean score (following the recommendation of Briere (1995)), to yield a single measure of post-traumatic distress (Traumatic Distress). Preliminary analyses indicated a positive skew in the overall mean score ($\gamma = 1.647$, SE = .168), requiring an additional square root statistical operation to normalize the data to meet the assumptions required of parametric analyses. This operation normalized the data and the positive skew was reduced ($\gamma = 1.374$, SE = .168). The new dependent mediating variable created from this transformation was named TSImean_sqrt.

Moderating Variable. Item scores from the Connor-Davidson Resilience Scale (CD-RISC) were summed to yield a total composite score. This was statistically centered by subtracting the overall mean from the sum for inclusion in the higher-level interaction term as a moderator in the proposed analysis (CDsum_c). The non-transformed Trauma Total score was also centered separately for its inclusion in the interaction term for the moderation analysis (TRAUMAtotal_c). Finally, the centered resilience score (CDsum_c) was multiplied by the centered trauma total (TRAUMAtotal_c) to create the hypothesized moderating interaction variable, TRAUMAxCDSUM.

Descriptives of Outcome and Predictor Variables

Variable construction procedures resulted in four factors used for analysis. These include two dependent variables, Somatic Malaise and Healthcare Behaviors/Utilization, and two predictor variables, Traumatic Distress and Resilience. Demographic variables included for

analysis were ethnicity, income, and number of people in the home. Descriptive statistics on this study's independent variable, Trauma Exposure, have been reported previously.

Somatic Malaise. As indicated, the Somatic Malaise variable was creating by averaging PILLdistress and Health Status scores together. The 49 PILL Likert-scale items were summed to yield a total PILLdistress score, with higher scores indicating a higher frequency of somatic symptoms. The range of scores for this measure is from 0 to 196, with each item rated from 0 to 4. In the current sample, the average PILLdistress score was 91.21, and ranged from 10 to 178 with a standard deviation of 28.16. For comparison purposes, overall means and standard deviations were calculated for the complete measure (PILLsum). Using all of the items included in the original PILL measure, the mean score was 105 (*SD* = 30.80). Previous studies have reported overall means of approximately 112.7 (*SD* = 24.7) with a total score of 216 (Pennebaker, 1982), indicating values for this sample to be comparable with those of previous studies.

A Health Status score, based on questions from the modified BRFSS (CDC, 2011), included ten items assessing perceptions of overall physical and mental health problems, restriction from daily activities, lack of preventive health behaviors, lack of perceived support, and overall life (dis)satisfaction. Questions were based on a 5-point Likert-scale rating (e.g. 1 = Very satisfied; 5 = Very dissatisfied), which were summed for a total score with a possible range of 10 - 50. Higher scores reflected poorer general perceptions of health. In this sample, the average total Health Status score was 22.32 with a standard deviation of 5.65. Participants' score ranged from 11 (good) to 45 (poor), however, indicating significant variability in perceptions of overall health status.

As discussed earlier, a Somatic Malaise variable was created to reflect a composite health ratings score by averaging the PILLdistress and Health Status scores together. The mean Somatic Malaise score for this sample was 56.91 (*SD* = 15.71). This sample's scores ranged from 16.5 (good) to 105.5 (poor), again suggesting a wide variability in perceptions of overall health.

Healthcare Behaviors/Utilization. Additional data were gathered about participants' physician visits in the past year, including number of visits, number of physician assigned diagnoses, and average level of care for the visits. These data were combined to create a Health Behaviors/Utilization variable. Participants in this study reported an average of 2.04 physician office visits (*SD* = 1.70), with a range from 0 visits to 9 visits in the past year; the mode number of visits was 1. Participants also received a mean 2.28 diagnoses from their physician in the past year (*SD* = 1.46). The total number of diagnoses given by a physician in one year ranged from 0 to 8; the mode number of diagnoses was 1. As discussed before, a CPTavg score was obtained by summing and averaging the weights assigned to each office visit in the past year. The mean CPTavg score for this sample was 2.41, with a standard deviation of 2.41. CPTavg scores ranged from 1 to 6, with individual visit weights taken before their average with other visits ranging from 1 to 6. The mean score of the composite Healthcare Behaviors/Utilization score for this sample was 2.33, with a standard deviation of 1.71. The range of scores for this variable was from 0 to 6.04.

Traumatic Distress. Participants responded to 100 items of the Trauma Symptom Inventory (TSI) to indicate their level of psychopathology over the past six months. The items of this measure related to the ten clinical scales into which the scale is divided: Anxious Arousal, Depression, Anger/Irritability, Intrusive Experiences, Defensive Avoidance, Dissociation, Sexual

Concerns, Dysfunctional Sexual Behavior, Impaired Self Reference, and Tension Reducing Behavior. For each of these clinical scales, a T-score at or above 65 is considered clinically significant. The mean T-scores for the clinical scales ranged from 45.80 to 49.0 (*SD* range: 6.80 – 9.61) (Appendix D, Table 1), placing participants' scores on the scales slightly below the designated average (t = 50) suggested by the developers of this scale (Briere, 1995) though scores were within the average range. However, individual respondent scores on these clinical scales range from 35 to 99, indicating that distress levels varied considerably in this sample.

An overall mean score was calculated by summing and then averaging scores on all ten scales for each participant, providing an overall distress score. The mean of overall t-score for psychological distress for this sample was t = 47.17 (*SD* = 6.56), with a range from 39.30 to 79.50. Only four participants' overall mean score met the clinical cutoff of T = 65. Overall, this sample reported significantly less distress than previous studies using this same measure (see Briere, 2003; Browne & Winkelman, 2007; Kniepp, Kelly, & Wise, 2011; McDevitt-Murphy, Weathers, & Adkins, 2005; Najavits et al., 2013; White, 2009), though prior studies have primarily utilized clinical samples. These participants' reported means for each clinical scale and overall distress were similar to average scores on clinical scales endorsed by participants without PTSD in Briere's original validation sample (M = 49.0, SD = 9.0). This sample's overall reported distress was significantly less than those, as reported by Briere in the TSI's validation study (2003), with PTSD (M = 67.03, SD = 11.6), Borderline Personality Disorder (BPD) (M = 69.5, *SD* = 10.67), and distress not meeting diagnostic criteria for either PTSD or BPD (M = 61.8, *SD* = 12.0). In another study's validation of the TSI as a measure for PTSD (McDevitt et al., 2005), the reported overall distress means for those with PTSD was 58.9 (*SD* = 10.7). Those without PTSD reported an overall distress mean of 51.1 (*SD* = 9.72).

Resilience. Participants responded to 25 items on the Connor-Davidson Resilience Scale (CD-RISC), which is used to identify characteristics of resilience. The 25 Likert-scale items were summed for a total resilience score, where higher scores reflected greater resilience. With the range of responses on each item from 0 to 4, the maximum sum score is 100. In this sample, the average resilience score was 78.86, with scores ranging from 33 to 100, and a standard deviation of 14.96.

Results are consistent with those of previous studies with the CD-RISC conducted by Connor and Davidson (2003). Their reported means ranged from 52.8 (*SD* = 20.4) in a population with diagnosed PTSD to 80.4 (*SD* = 12.8) in a general population. Standard deviations from previous studies ranged from 10.7 to 20.4, illustrating consistency with the standard deviation found with this sample. In a general population, to which this sample is most similar both conceptually and functionally, Connor and Davidson (2003) reported mean scores of 80.4 with a standard deviation of 12.8. This sample's reported levels of resilience are also comparable to results of another study that focused on predictors of resilience and subsequent traumatic distress in a college sample (White, 2009), in which the average resilience score was 71.43, with scores ranging from 36 to 99 and a standard deviation of 14.20.

Demographic Predictors. Preliminary regression analyses had indicated that ethnicity, the number of people living in the home, and income each significantly predicted Somatic Malaise, Healthcare Behaviors/Utilization, and Traumatic Distress. As such, each dependent variable was first regressed on ethnicity, number of people living in the home, and income in the first step of each regression analysis. A dummy code was created for ethnicity for analysis, as it was not a continuous variable. Caucasians (1) comprised (n = 154) the referent group. The

dummy code (2) group (n = 51) was comprised of 82% (n = 42) African Americans, with only 9 participants representing Hispanic (n = 4), Asian (n =3), and other (n = 2) ethnicities.

Additional analyses were performed to examine differences between the groups Caucasian and non-Caucasian (effectively African American) on each dependent variable: Somatic Malaise, Healthcare Behaviors/Utilization, and Traumatic Distress. Caucasians were found to have slightly lower levels of Traumatic Distress (M = 46.69) than non-Caucasians (M = 48.71), as well as lower Healthcare Behaviors/Utilization scores (M = 2.09) than non-Caucasians (M = 2.37). Caucasians had slightly higher levels of Somatic Malaise (M = 57.45) than non-Caucasians (M = 55.02).

Closer examination of the differences among the ethnic groups included in the dummy variable showed that the small percentage of participants of Hispanic/Latino, Asian, and other ethnicities had lower levels of Somatic Malaise than both Caucasians and African Americans. Hispanics had Traumatic Distress levels lower than African Americans, but higher than Caucasians, while Asians and other ethnicities had lower Traumatic Distress levels than all other groups. Hispanics and Asians had higher Healthcare Behaviors/Utilization scores than Caucasians, but were comparable to utilization scores in African Americans. However, the small range of scores and low number of individuals limited the ability to determine significance or make meaningful interpretations regarding the characteristics of the other ethnic groups. The variability in Traumatic Distress, Somatic Malaise, and Healthcare Behaviors/Utilization among non-Caucasian, non-African American ethnic groups was insignificant such that, when combined, differences between the non-Caucasian and Caucasian groups were due a high numbers of African-American participants whose scores differed from Caucasian participants'.

Similar analyses examined how differences in income and number of people in the home

related to Somatic Malaise, Healthcare Behaviors, and Traumatic Distress. Generally, participants who reported lower income (i.e., less than $35,000/year) endorsed slightly higher levels of Somatic Malaise (M = 59.88), Healthcare Behaviors/Utilization (M = 2.41), and Traumatic Distress (M = 49.84) compared to those with higher income (i.e., $75,000 or more/year) (Somatic Malaise, M = 54.32; Healthcare Behaviors/Utilization, M = 2.00; Traumatic Distress, M = 45.43). When looking at the number of people in the home, those with fewer household members (i.e., less than 3) generally had slightly higher levels of Somatic Malaise (M = 61.34), Healthcare Behaviors/Utilization (M = 2.30), and Traumatic Distress (M = 48.95) than those with more people in the home (i.e., 3 or more) (Somatic Malaise, M = 55.29; Healthcare Behaviors/Utilization, M = 1.73; Traumatic Distress, M = 46.63). However, the small range of scores and low number of participants reporting 6 or more people living in the home limit the ability to determine significance or make meaningful interpretations regarding the functional nature of those with high numbers of people in the household.

Primary Data Analyses

To confirm the role of trauma exposure in predicting physical health outcomes as measured by somatic symptoms and healthcare utilization dimensions of physical health, scores on Somatic Malaise and Healthcare Behaviors/Utilization were regressed on salient demographic factors and number of traumatic exposures (Trauma Total_sqrt) in two regression analyses.

Although the impact of demographic characteristics on physical health scores were not variables of primary interest in this study, prior research (Boscarino, 2008; Brewin et al., 2000; Krueger et al., 2003; Looper & Kirmeyer, 2002) has indicated that demographic factors such as age, ethnicity, socioeconomic status, education, and other such variables may impact health outcomes in other studies. Consequently regression analyses were conducted from each of this

study's demographic variables (i.e. age, ethnicity, marital status, education, employment, income, number of people in home) were conducted to assess the potential impact of demographic variables on this study's measures of physical health (i.e Somatic Malaise and Healthcare Behaviors/Utilization). Three demographic characteristics of the sample were found to contribute significant variance to physical health outcomes: ethnicity, number of people in the home, and income. These demographic factors were subsequently controlled as covariates in the primary regression analyses.

In the first step of the first regression analysis, Somatic Malaise was regressed on ethnicity, people living in the home, and income. In the second step Somatic Malaise was regressed upon TraumaTotal_sqrt, holding the aforementioned demographic factors constant. To test the predictive role of Trauma Exposure in predicting Healthcare Behaviors/Utilization, the same procedure was repeated in the second regression analysis.

To confirm the role of Traumatic Distress as a mediator between Trauma Exposure and physical health problems, scores on each of the two outcome measures of physical health (e.g. Somatic Malaise, Healthcare Behaviors/Utilization) were then regressed on scores from the TSI (TSImean_sqrt) and number of traumatic exposures (Trauma Total_sqrt). In the first set of analyses, according to the guidelines set forth by Baron and Kenny (1986) for statistical tests of mediation, Somatic Malaise was regressed on Trauma Total_sqrt while holding demographic factors constant. Then TSImean_sqrt was regressed on Trauma Total_sqrt. Finally, Somatic Malaise was regressed on both Trauma Total_sqrt and TSImean_sqrt to determine the mediating variance contributed by Traumatic Distress. To test the contribution of Traumatic Distress (TSImean_sqrt) in mediating the relationship between Trauma Exposure and Healthcare Behaviors/Utilization, the same procedure was repeated.

Next, to determine the role of Resilience as a potential moderator between Trauma Exposure and physical health problems, data from each of the two physical health outcomes scores (i.e. Somatic Malaise and Healthcare Behaviors/Utilization) were then regressed on centered Resilience (CDsum_c) and Trauma Exposure (TRAUMAtotal_c) scores while controlling for demographics. Using the interaction term created from centered resilience and trauma total scores, Somatic Malaise was first regressed on the centered CDsum_c and TRAUMAtotal_c, with the interaction term TRAUMAxCDSUM entered on the second step. For the analyses testing for the moderation of Resilience of Healthcare Behaviors/Utilization, this statistical procedure was repeated.

Finally, to determine the role of Resilience as a moderator between Trauma Exposure and Traumatic Distress, Traumatic Distress was regressed on centered Resilience (CDsum_c) and Trauma Exposure (TRAUMAtotal_c) scores. The transformed TSI mean score (TSImean_sqrt) was regressed first on the centered CDsum_C and TRAUMAtotal_c separately, while holding demographic variables constant. The interaction term TRAUMAxCDSUM was entered on the second step to determine the amount of variance contributed to traumatic distress by the interaction of trauma exposure and resilience.

Hypotheses

Correlations among the primary variables of interest (i.e., Trauma Total, Traumatic Distress, Resilience, Somatic Malaise, and Healthcare Behaviors/Utilization) are displayed in Table 5. A figural representation of the relations among the primary variables of interest is displayed in Figure 2. Initial examination of variables indicated that trauma exposure was positively related to experience of physical distress, or higher frequency of somatic symptoms and more functional impairment as indicated by higher scores on the Somatic Malaise factor

Table 5. Pearson Correlations Among Variables

	Trauma Total	Somatic Malaise	Healthcare Utilization	Traumatic Distress (TSImean)
Trauma Total				
Somatic Malaise	.339**			
Healthcare Utilization	.019	.078		
Traumatic Distress (TSImean)	.433**	.457**	.057	
Resilience (CDsum)	-.203**	-.207**	.005	-.504**

Note. ** = Significant at the p < .01level.

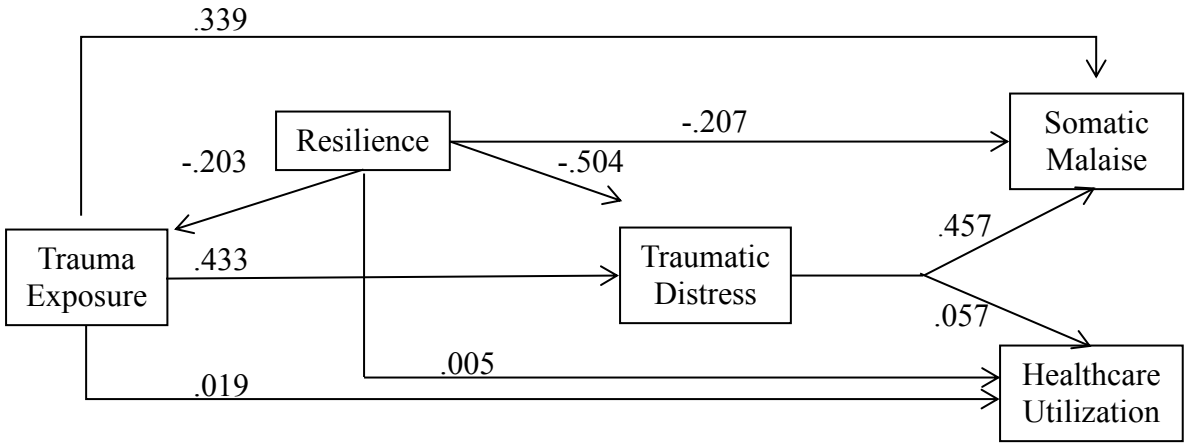

Figure 2. Zero-Order Correlations Among Primary Variables of Interest. This figure illustrates the correlations among the variables examined in this study. The strength of the relations are indicated by effect sizes displayed on each arrow representing the relation.

Note. Information regarding hypothesized relations among variables is provided following their respective regression tables.

being associated with higher Trauma Total scores. However, Trauma Total scores were not significantly correlated with Healthcare Behaviors/Utilization scores.

Trauma Exposure was also positively related to Traumatic Distress, such that higher scores on the TSImean were associated with higher Trauma Total scores, and lower TSImean scores were associated with lower Trauma Total scores. Trauma Exposure was negatively correlated with Resilience, where those with higher Trauma Total scores were more likely to have lower CDsum scores.

Traumatic Distress (TSImean) scores were positively correlated with Somatic Malaise scores as well, indicating that higher levels of traumatic distress are associated with poorer perceptions of overall health. Traumatic Distress was not significantly associated with increased help-seeking behavior, as indicated by a non-significant positive correlation between TSImean scores and scores on the Healthcare Behaviors/Utilization factor (Table 5). Trauma Exposure was negatively correlated with Resilience, where those with higher Trauma Total scores were more likely to have lower CDsum scores.

Traumatic Distress (TSImean) scores were positively correlated with Somatic Malaise scores as well, indicating that higher levels of traumatic distress are associated with poorer perceptions of overall health. Traumatic Distress was not significantly associated with increased help-seeking behavior, as indicated by a non-significant positive correlation between TSImean scores and scores on the Healthcare Behaviors/Utilization factor (Table 5). Traumatic Distress was significantly negatively correlated with Resilience, such that higher TSImean scores were associated with lower CDsum scores. It also appears that those reporting higher levels of traumatic distress also reported lower levels of resilience than those who reported lower levels of traumatic distress (see Table 5).

Total scores were more likely to have lower CDsum scores.

Traumatic Distress (TSImean) scores were positively correlated with Somatic Malaise scores as well, indicating that higher levels of traumatic distress are associated with poorer perceptions of overall health. Traumatic Distress was not significantly associated with increased help-seeking behavior, as indicated by a non-significant positive correlation between TSImean scores and scores on the Healthcare Behaviors/Utilization factor (Table 5). Traumatic Distress was significantly negatively correlated with Resilience, such that higher TSImean scores were associated with lower CDsum scores. It also appears that those reporting higher levels of traumatic distress also reported lower levels of resilience than those who reported lower levels of traumatic distress (see Table 5).

Finally, CD-RISC scores were negatively correlated with Somatic Malaise scores, such that higher levels of Resilience were associated with less reporting of somatic symptoms and better perceptions of overall health functioning. Interestingly, there was a positive, though weak, association between Resilience and healthcare utilization, where higher CDsum scores were associated with higher Healthcare Behavior/Utilization scores. See Table 5 for correlation values and respective effect sizes.

Regressions. The first regression analysis tested the prediction of health outcome as measured by Somatic Malaise from Trauma Exposure (Trauma Total_sqrt) in two steps. Table 6 displays the results of the analyses including the un-standardized regression coefficient (B), the standardized regression coefficient (β), the t-value of the individual beta weights for the predictors, the change in R^2 (ΔR^2), and the F Change value (ΔF). Figure 3 also displays resulting relations among variables as represented by the standardized regression coefficients. In the regression determining the predictive variance of trauma exposure for Somatic Malaise, results

Table 6. Summary of Multiple Hierarchical Regression Analysis for Trauma Exposure Predicting Somatic Malaise

	ΔR2	**ΔF**		**Sig F**	
Step 1	.058	4.018		.008	
	B	**SE**	**β**	**t**	**p**
Income	-3.652	1.525	-.183	-2.395	.018
People in Home	-1.574	.742	-.148	-2.122	.035
Ethnicity	-5.107	2.754	-.142	-1.854	.065
	ΔR2	**ΔF**		**Sig F**	
Step 2	.100	23.378		.0001	
	B	**SE**	**β**	**t**	**p**
Trauma Exposure	5.257	1.087	.330	4.835	.0001

Note. Covariates of Income, People in Home, and Ethnicity were entered into Step 1 and controlled for in subsequent steps.

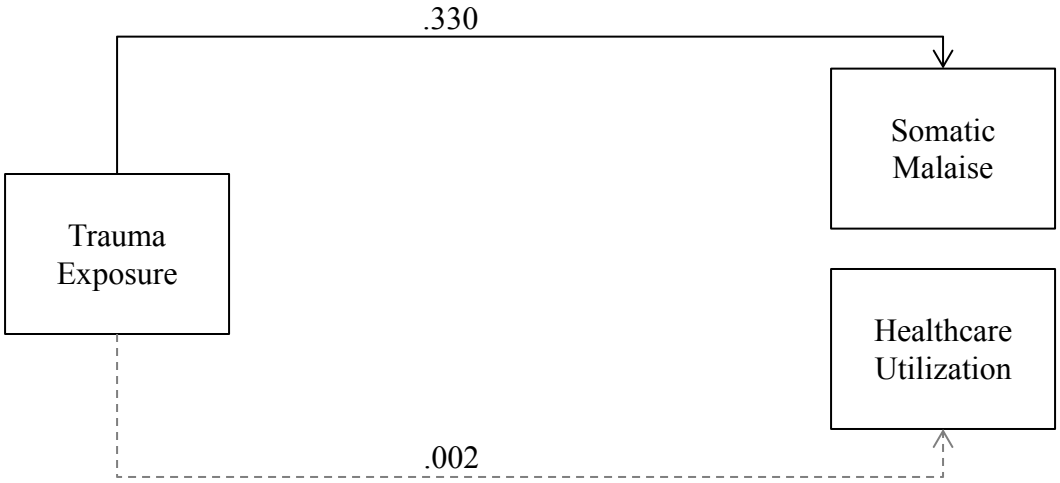

Figure 3. Standardized Beta Weights for Analysis Testing Traumatic Distress as a Mediator for Trauma Exposure Predicting Physical Health Outcomes (Hypothesis 2). This figure illustrates the strength of the relations between the tested variables. Solid arrows indicate significant relations, while dashed arrows indicate insignificant relations.

indicated that Step 1, which included demographic variables of ethnicity, number of people in the home, and income, significantly predicted Somatic Malaise, explaining 5.8% of its variance. ($\Delta R^2 = .058$, $\Delta F = 4.018$, $p < 0.01$). Caucasian ethnicity, fewer people in the home, and lower income were associated with higher Somatic Malaise scores. Step 2 added TraumaTotal_sqrt to the model while controlling for the variance contributed by demographics. The results showed that the addition of Trauma Exposure (Trauma Total_sqrt) to the model while controlling for demographics contributed a significant amount of variance in predicting Somatic Malaise, explaining an additional 10% of the variance in Somatic Malaise above and beyond that variance explained by demographic factors alone. ($\Delta R^2 = .10$, $\Delta F = 23.378$, $p < .01$).

The next regression analysis tested the amount of variance in Healthcare Behaviors/Utilization contributed to by Trauma Exposure (Trauma Total_sqrt) (Table 7). The results showed that Step 1, which included ethnicity, number of people in home, and income, was not significant in predicting Healthcare Behaviors/Utilization. ($\Delta R^2 = .031$, $\Delta F = 2.058$, $p > 0.05$). Step 2, which added Trauma Exposure (Trauma Total_sqrt) to the model while controlling for demographics, was also not a significant predictor of variance in Healthcare Behaviors/Utilization. ($\Delta R^2 = .0001$, $\Delta F = .001$, $p > 0.05$).

As such, the first set of regressions showed that Trauma Exposure was a significant predictor of Somatic Malaise, above and beyond that of associated demographic factors. However, Trauma Exposure (Trauma Total_sqrt) was not a significant predictor of Healthcare Behaviors/Utilization. Neither demographic variables of income, ethnicity, and number of people in the home were significant predictors of Healthcare Behaviors/Utilization.

Table 7. Summary of Multiple Hierarchical Regression Analysis for Trauma Exposure Predicting Healthcare Utilization

	ΔR2	ΔF		Sig F	
Step 1	.031	2.058		.107	
	B	**SE**	**β**	**t**	**p**
Income	-.156	.127	-.095	-1.227	.221
People in Home	-.103	.062	-.118	-1.670	.097
Ethnicity	.185	.229	.063	.806	.421
	ΔR2	**ΔF**		**Sig F**	
Step 2	.0001	.001		.997	
	B	**SE**	**β**	**t**	**p**
Trauma Exposure	.003	.096	.002	.029	.997

Note. Covariates of Income, People in Home, and Ethnicity were entered into Step 1 and controlled for in subsequent steps.

Mediation. Table 8 provides as summary of the multiple regression analyses conducted to determine the predictive value of Traumatic Distress (TSImean_sqrt) as a mediator in the relation between Trauma Exposure (Trauma Total_sqrt) and Somatic Malaise. Figure 4 displays the relations among the variables as represented by their respective standardized regression coefficients. It was hypothesized that Traumatic Distress (TSImean_sqrt) would enhance the prediction of Somatic Malaise following Trauma Exposure. Following the procedures recommended by Baron and Kenny (1986), the first analysis verified that Trauma Exposure (Trauma Total_sqrt) contributed a significant amount of variance to the prediction of Somatic Malaise above and beyond that of demographic variables, as shown in the first set of regression analyses in Table 8.

In the second step, TSImean_sqrt scores were regressed on Trauma Total_sqrt while holding ethnicity, number of people in home, and income constant. Demographic factors were found to contribute 8.3% of variance to Traumatic Distress (TSImean_sqrt), where lower income, and fewer people in the home were associated with higher TSImean_sqrt scores. (ΔR^2 = .083, $\Delta F = 5.944$, $p < 0.01$). Results showed that Trauma Exposure (Trauma Total_sqrt) was a significant predictor of Traumatic Distress (TSImean_sqrt) when controlling for demographics, accounting for an additional 15.1% of variance in Traumatic Distress above and beyond the predictive variance contributed by demographic factors. ($\Delta R^2 = .151$, $\Delta F = 38.717$, $p < 0.001$). The results confirmed that the independent variable (Trauma Total_sqrt) is a significant predictor of the proposed mediator (TSImean_sqrt), meeting the second criterion necessary for evidence of mediation according to Baron and Kenny (1986). The third step of mediation analyses aimed to confirm the proposed mediator (TSImean_sqrt) as a significant predictor of the dependent variable (Somatic Malaise) while controlling for the independent variable (Trauma Total_sqrt)

Table 8. Summary of Multiple Hierarchical Regression Analyses Testing Traumatic Distress as a Mediator in the Relation Between Trauma Exposure and Somatic Malaise

Step 1: Summary of Regression Analysis for Trauma Exposure (IV) Predicting Somatic Malaise (DV)

	ΔR2	ΔF		Sig F	
Step 1	.058	4.018		.008	
	B	**SE**	**β**	**t**	**p**
Income	-3.652	1.525	-.183	-2.395	.018
People in Home	-1.574	.742	-.148	-2.122	.035
Ethnicity	-5.107	2.754	-.142	-1.854	.065
	ΔR2	**ΔF**		**Sig F**	
Step 2	.100	23.378		.0001	
	B	**SE**	**β**	**t**	**p**
Trauma Exposure	5.257	1.087	.330	4.835	.0001

Step 2: Summary of Regression Analysis for Trauma Exposure (IV) Predicting Traumatic Distress (MV)

	ΔR2	ΔF		Sig F	
Step 1	.083	5.944		.001	
	B	**SE**	**β**	**t**	**p**
Income	-.147	.045	-.249	-3.303	.001
People in Home	-.025	.022	-.079	-1.157	.249
Ethnicity	.062	.080	.058	.771	.442
	ΔR2	**ΔF**		**Sig F**	
Step 2	.151	38.717		.0001	
	B	**SE**	**β**	**t**	**p**
Trauma Exposure	.191	.031	.405	6.222	.0001

Step 3: Summary of Regression Analysis for Traumatic Distress (MV) Predicting Somatic Malaise (DV)

	ΔR2	ΔF		Sig F	
Step 1	.058	4.018		.008	
	B	**SE**	**β**	**t**	**p**
Income	-.750	1.407	-.038	-2.395	.018
People in Home	-1.432	.665	-.079	-.134	.035
Ethnicity	-5.455	2.449	-.152	-2.227	.065
	ΔR2	**ΔF**		**Sig F**	
Step 2	.100	23.378		.0001	
	B	**SE**	**β**	**t**	**p**
Trauma Exposure	2.771	1.109	.174	2.498	.0001
	ΔR2	**ΔF**		**Sig F**	
Step 3	.114	30.447		.0001	
	B	**SE**	**β**	**t**	**p**
Traumatic Distress	13.023	2.360	.385	5.518	.0001

Note. Covariates of Income, People in Home, and Ethnicity were entered into Step 1 and controlled for in subsequent steps.

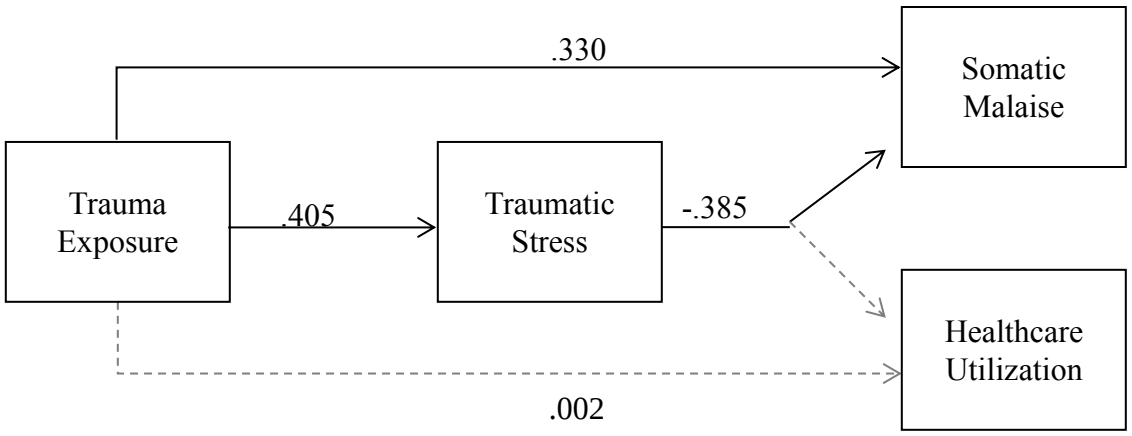

Figure 4. Standardized Beta Weights for Analysis Testing Traumatic Distress as a Mediator for Trauma Exposure Predicting Physical Health Outcomes (Hypothesis 2). This figure illustrates the strength of the relations between the tested variables. Solid arrows indicate significant relations, while dashed arrows indicate insignificant relations.

and demographic factors. The results from this last step of mediation analyses showed that Traumatic Distress (TSImean_sqrt) scores did enhance the prediction of Somatic Malaise while controlling for Trauma Exposure (Trauma Total_sqrt) and demographic factors. TraumaticDistress (TSImean_sqrt) accounted for an additional 11.4% of variance in Somatic Malaise above and beyond that variance contributed by demographic factors and Trauma Exposure (Trauma Total_sqrt). ($\Delta R^2 = .114$, $\Delta F = 30.447$, $p < 0.01$). However, Trauma Exposure (Trauma Total_sqrt) remained a significant predictor of Somatic Malaise with the addition of Traumatic Distress (TSImean_sqrt) to the model, even when being controlled for, still explaining 10% of the variance in Somatic Malaise in the final model. ($\Delta R^2 = .10$, $\Delta F = 23.378$, $p < 0.001$). As such, the results from this mediation analyses meet the criteria set forth by Baron and Kenny (1986) to indicate that Traumatic Distress (TSImean_sqrt) is indeed a partial mediator in the relation between Trauma Exposure (Trauma Total_sqrt) and Somatic Malaise. The variance in Somatic Malaise is significantly more explained by the addition of Traumatic Distress (TSImean_sqrt) to the predictive model. Traumatic Distress (TSImean_sqrt) does not meet criteria as a full mediator in the relation between Trauma Exposure (Trauma Total_sqrt) and Somatic Malaise, as Trauma Exposure still accounts for a significant amount of variance in Somatic Malaise after Traumatic Distress is added to the predictive model.

It was not necessary to conduct mediation analyses to test the hypothesis that traumatic distress acts as a mediator in the relation between Trauma Exposure and Healthcare Behaviors/Utilization based on results from the first set of regressions. Previous analyses showed that Trauma Exposure (Trauma Total_sqrt) was not a significant predictor for the independent variable, Healthcare Behaviors/Utilization. Therefore, the first criteria necessary for mediation (Baron & Kenny, 1986) was not met, excluding Traumatic Distress (TSImean_sqrt) as

a mediator in the relation between trauma exposure and Healthcare Behaviors/Utilization as there was no relation between the independent and dependent variables.

Moderation. Table 9 displays a summary of the third set of regression analyses that tested the role of Resilience (CDsum_c) as a moderator in the relation between Trauma Exposure (TRAUMAtotal_c) and physical health outcomes (Somatic Malaise and Healthcare Behaviors/Utilization), such that the interaction of Resilience with Trauma Exposure (TRAUMAxCDSUM) would explain significantly more variance in physical health outcomes beyond demographics, trauma exposure, or resilience alone. Figure 5 is a figural representation of the hypothesized relations with resulting standardized beta weights displayed. Somatic Malaise scores were regressed on the centered variables, CDsum_c and TRAUMAtotal_c in the step holding demographic factors constant, with the interaction term TRAUMAxCDSUM added to the model in the next step. Results revealed that although Resilience (CDsum_c) and Trauma Exposure (TRAUMAtotal_c) account for an additional 12.9% of variance in Somatic Malaise after controlling for that contributed by demographic factors ($\Delta R2 = .129$, $\Delta F = 15.401$, $p < 0.01$), the interaction of Resilience and Trauma Exposure (TRAUMAxCDSUM) does not explain significantly unique variance in the prediction of Somatic Malaise. ($\Delta R2 = .006$, $\Delta F = 1.508$, $p > .05$). These results suggest that while Resilience contributes significant variance to somatic distress levels following trauma, the variance in Somatic Malaise accounted for by Trauma Exposure does not vary as a function of Resilience.

Table 10 provides a summary of the regression analyses conducted to test the role of Resilience (CDsum_c) as a moderator in the relation between Trauma Exposure (TRAUMAtotal_c) and Healthcare Behaviors/Utilization, such that the interaction of

Table 9. Summary of Multiple Regression Analyses Testing Resilience as a Moderator in the Relation Between Trauma Exposure and Somatic Malaise

	ΔR2	ΔF		Sig F	
Step 1	.058	4.018		.008	
	B	**SE**	**β**	**t**	**p**
Income	-1.203	1.487	-.060	-1.706	.018
People in Home	-2.000	.696	-.188	-2.874	.035
Ethnicity	-4.396	2.577	-.123	-1.706	.065
	ΔR2	**ΔF**		**Sig F**	
Step 2	.129	15.401		.0001	
	B	**SE**	**β**	**t**	**p**
Trauma Exposure	1.766	.369	.336	4.788	.0001
Resilience	-.158	.067	-.158	-2.371	.018
	ΔR2	**ΔF**		**Sig F**	
Step 3	.006	1.508		.221	
	B	**SE**	**β**	**t**	**p**
Trauma x Resilience	.032	.026	.082	1.228	.221

Note. Covariates of Income, People in Home, and Ethnicity were entered into Step 1 and controlled for in subsequent steps.

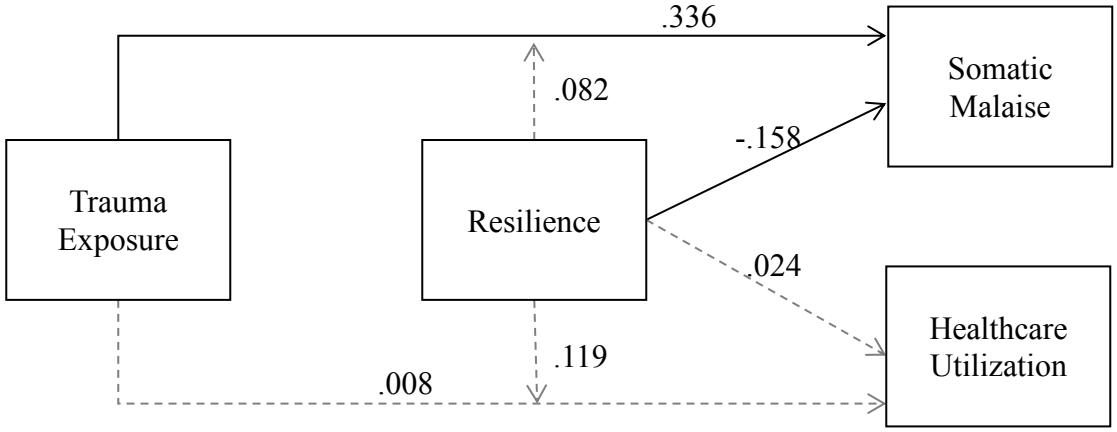

Figure 5. Standardized Beta Weights for Analysis Testing Resilience as a Moderator for Trauma Exposure Predicting Physical Health Outcomes (Hypothesis 3). This figure illustrates the strength of the relations between the tested variables. Solid arrows indicate significant relations, while dashed arrows indicate insignificant relations.

Table 10. Summary of Multiple Regression Analyses Testing Resilience as a Moderator in the Relation Between Trauma Exposure and Healthcare Utilization

	ΔR2	ΔF		Sig F	
Step 1	.031	2.058		.107	
	B	**SE**	**β**	**t**	**p**
Income	-1.68	.133	-.103	-1.264	.221
People in Home	-.100	.062	-.115	-1.615	.097
Ethnicity	.180	.230	.061	.782	.435
	ΔR2	**ΔF**		**Sig F**	
Step 2	.001	.116		.890	
	B	**SE**	**β**	**t**	**p**
Trauma Exposure	.003	.033	.008	.100	.741
Resilience	.002	.006	.024	.330	.764
	ΔR2	**ΔF**		**Sig F**	
Step 3	.013	2.683		.103	
	B	**SE**	**β**	**t**	**p**
Trauma x Resilience	.004	.002	.119	1.638	.103

Note. Covariates of Income, People in Home, and Ethnicity were entered into Step 1 and controlled for in subsequent steps.

Resilience with Trauma Exposure would account for significantly more variance in the prediction of Healthcare Behaviors/Utilization than demographics, Trauma Exposure, or Resilience alone. Healthcare Behaviors/Utilization scores were regressed on Resilience (CDSum_c) and Trauma Exposure (TRAUMAtotal_c) scores while controlling for demographic factors as before, then again on the interaction TRAUMAxCDSUM term. Results indicated that Resilience and Trauma Exposure, when entered as separate variables, did not significantly predict Healthcare Behaviors/Utilization. ($\Delta R2 = .001$, $\Delta F = .116$, $p > 0.05$). Further, the interaction of Resilience and Trauma Exposure (TRAUMAxCDSUM) did not explain a significant amount of variance in the prediction of Healthcare Behaviors/Utilization. ($\Delta R^2 = .013$, $\Delta F = 2.683$, $p > 0.05$).

Finally, TSImean_sqrt scores were regressed on CDSUM_c and TRAUMAtotal_c scores, with the interaction TRAUMAxCDSUM entered on the second step. A summary of these analyses is displayed in Table 11. Figure 6 is a figural representation of the hypothesized relations with resulting standardized beta weights displayed. Results showed that resilience scores were a significant predictor of variance in traumatic distress scores, explaining 32.8% of the variance in TSImean_sqrt scores ($\Delta R2 = .328$, $\Delta F = 54.400$, $p < 0.01$). However, the interaction of TRAUMAxCDSUM did not explain significantly more variance in the prediction of TSImean_sqrt ($\Delta R2 = .002$, $\Delta F = .530$, $p > 0.05$). These results suggest that while resilience contributes significant variance to traumatic distress levels following trauma, the variance in traumatic distress accounted for by trauma exposure does not vary as a function of resilience.

Table 11. Summary of Multiple Regression Analyses Testing Resilience as a Moderator in the Relation Between Trauma Exposure and Traumatic Distress

	ΔR2	ΔF		Sig F	
Step 1	.083	5.944		.001	
	B	**SE**	**β**	**t**	**p**
Income	-.147	.045	-.249	-3.303	.001
People in Home	-.025	.022	-.079	-1.157	.249
Ethnicity	.062	.080	.058	.771	.442
	ΔR2	**ΔF**		**Sig F**	
Step 2	.328	54.400		.0001	
	B	**SE**	**β**	**t**	**p**
Trauma Exposure	.055	.009	.356	6.159	.0001
Resilience	-.013	.002	-.424	-7.465	.0001
	ΔR2	**ΔF**		**Sig F**	
Step 3	.002	.530		.467	
	B	**SE**	**β**	**t**	**p**
Trauma x Resilience	.0001	.001	-.041	-.728	.467

Note. Covariates of Income, People in Home, and Ethnicity were entered into Step 1 and controlled for in subsequent steps.

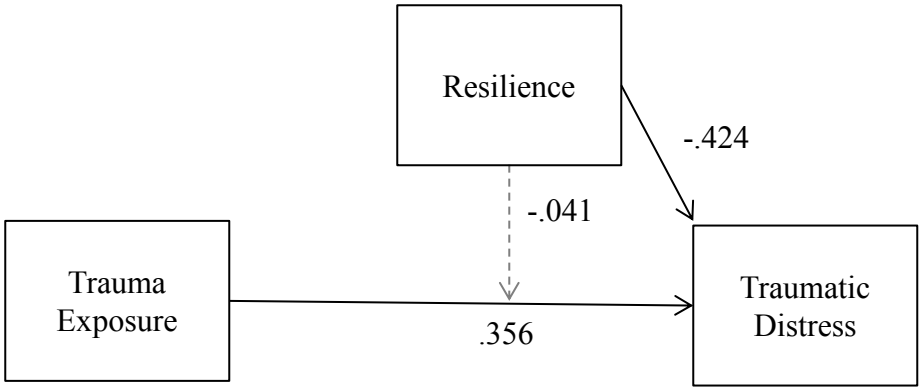

Figure 6. Standardized Beta Weights for Analysis Testing Resilience as a Moderator for Trauma Exposure Predicting Traumatic Distress (Hypothesis 4). This figure illustrates the strength of the relations between the tested variables. Solid arrows indicate significant relations, while dashed arrows indicate insignificant relations.

Discussion

This study investigated the relation between lifetime traumatic experiences/exposure and physical health problems in a sample of patients in a private practice OB/GYN outpatient sample. The study examined the role of traumatic distress (e.g. PSS), as measured by common patient psychiatric symptom reporting, as a mediator in the relation between trauma exposure and physical health, with physical health measured by somatic symptoms and healthcare utilization. The role of resilience was examined as a moderator between trauma exposure and physical health, as well as between trauma exposure and the development of traumatic distress.

This study focused primarily on determining the role of traumatic distress (PSS) and resilience, respectively, in affecting physical health outcomes of somatic symptoms and healthcare utilization following trauma. Specifically, this study was interested in determining whether the consideration of a range of traumatic distress enhanced the prediction of physical health outcomes above and beyond that of the variance explained by trauma exposure itself. The study also examined the role of resilience, investigating whether the amount of variance in physical health outcomes explained by trauma exposure varied as a function of resilience, and also if traumatic distress explained by trauma exposure varied according to level of resilience. These questions were examined using a series of multiple regression analyses to explore the relations among the variables of interest in this study.

Trauma exposure accounted for a significant amount of variance in somatic malaise but not healthcare utilization. Traumatic distress (PSS) enhanced the prediction of somatic malaise following trauma exposure, although trauma exposure remained a significant predictor of somatic malaise when considering traumatic distress. While resilience was itself a significant predictor of both somatic malaise and traumatic distress, the effects of trauma exposure did not

vary as a function of resilience, indicating that resilience does not moderate the relation between trauma exposure and somatic malaise or traumatic distress.

It is important to note that trauma exposure was not found to be a significant predictor of healthcare utilization, although trauma exposure did explain a significant amount of variance in levels of reported somatic malaise. Further, in this study, healthcare utilization as an outcome variable was not strongly associated with any other variables of interest in this study. The possible implications of this finding will be discussed generally for both brevity and clarity, rather than review its null finding with each hypothesis.

Not only was utilization not related to the other dependent variable in this study, somatic malaise, but also it was not strongly associated with the study's predictor variables, traumatic distress and resilience. The results suggest a significant difference in the manner in which trauma, and traumatic distress or PSS in particular, impact survivors' experience of their overall physical health versus the manner in which they seek care and support for potential medical problems.

It may be that one's experience of physical health is not significantly associated with the manner in which individuals seek treatment for physical distress, such that individuals may experience physical malaise but not seek medical attention for relief of that distress. It is possible that malaise generated from physical distress among participants in this sample did not meet a level of severity to significantly affect physical functioning or cause enough distress to motivate help-seeking behaviors. It may also be that those who might need medical attention do not seek care when appropriate for a number of reasons, including avoidance of distress, discomfort, or frustration at not experiencing relief from seeking medical care.

It is also possible that the measurement of utilization in this study did not appropriately capture the construct of utilization as expected when designing the study. However, while this study did not assess for self-reported primary care or ER visits, its conceptualization and measurement of physical health outcomes is comparable to other recent studies investigating similar associations between trauma exposure and physical health perceptions and healthcare utilization (Chartier et al., 2010). As discussed previously, the scope of available data may have been limited by sampling a specialty clinic where the patient sample traditionally presents for preventive or routine care. There was a limited range of utilization rates within a treatment seeking or utilizing sample that also negative affected the conclusions that may have been drawn about this sample's utilization patterns. It may also be that the participants who chose to respond to the study questionnaire were self-selected such that those who opted to participate in the study overall were functioning at a high level of adaptive functioning, both in terms of psychological and physical health. Although this potential pattern of sample self-selection cannot be controlled, it does have significant implications for the findings of this study and conclusions that may be drawn.

While the sample in this study was diverse in age range and trauma histories, overall the participants were largely Caucasian, married, well-educated, employed, middle-class, and not currently reporting significant psychiatric distress. The majority of participants had presented once for medical treatment to the OB/GYN practice in the past year, in most cases for routine annual care or for prenatal care. Based on the resulting data from measures of psychological distress and resilience, this sample was, on average, both high in resilience and low in psychological distress, with little range in functioning. This sample appears to be resilient and functioning psychologically at a moderately high level. It therefore is important to consider the

low symptomatic distress and fairly resilient nature of this sample when discussing the results of this study. Not only does this sample well represent a general female sample presenting on any given day to a private medical specialty practice, the level of psychological functioning in this female community sample is generally comparable to that of the majority of individuals who exhibit resilience following trauma (Bonanno et al., 2010; Connor & Davidson, 2003).

This sample's high level of psychological functioning was also reflected in a number of factors in the sample's demographic makeup that may objectively indicate high levels of adaptive functioning, including high levels of education, employment, and yearly income. These areas of high functioning are especially salient as they contribute significantly to overall well-being in terms of being able to meet basic physical and instrumental needs, thereby reducing a significant potential for additional life stress not related to previous trauma exposure. It may also be that these objective markers are additional indicators of adaptive functioning following trauma exposure, and suggest an ability to exhibit resilience in response to negative life events.

Age of participants is also an important demographic to consider when exploring the overall high functioning of this sample. It may be that these adult women, a majority of whom reported childhood trauma exposure, were not in significant psychological distress because they had recovered and/or responded resiliently over time to the negative effects of previous trauma exposure. This study's findings are consistent with previous empirical findings that most trauma-exposed people respond adaptively over time (Bonanno et al., 2010; Connor & Davidson, 2003; McNally, 2003; White, 2009). The findings contribute further to the body of recent data indicating that resilience is a normative process following stressful life events (Bonanno et al., 2010; McNally, 2003), particularly after long periods of time.

The hypotheses examined in this study surrounded determining the role of a range of traumatic distress (PSS) as a potential mediator in the relation between trauma exposure and physical health, and also explored the role of resilience as a potential moderator in the same relation. It was first hypothesized that trauma exposure would contribute more variance than demographic covariates (i.e. ethnicity, income, number of people living in home) in predicting somatic malaise (Hypothesis 1a). This hypothesis was supported by the resulting data, indicating that exposure to trauma explains significantly more variance in reported physical symptoms and impairment due to physical malaise, above and beyond that predictive variance contributed by demographic covariates.

In terms of demographic influences, in this sample of women seeking services at a private OB/GYN practice, lower income, fewer people in the household, and Caucasian ethnicity were associated with higher levels of reported somatic malaise. The finding of income as a significant predictor is consistent with previous studies showing lower SES to be associated with an increased risk for the development of both physical and psychological distress following trauma (Bonanno et al., 2007; Brewin et al., 2000; King et al., 1998; O'Leary, 1998; Taft et al., 1999). However, the finding that Caucasian ethnicity contributed to enhanced prediction of somatic malaise was unexpected, given consistent findings across multiple studies showing minority ethnic status to be associated with increased risk for physical and mental health problems following trauma (Agaibi & Wilson, 2005; Campbell & Lewandoski, 1997; DeRoon-Cassini et al., 2010). It should also be noted, however, that Caucasian ethnicity was also associated with higher levels of resilience and lower levels of traumatic distress (PSS), suggesting that, in this sample of women seeking OB/GYN care at a private practice, Caucasian women were generally functioning better psychologically. It may be that people who are

relatively psychologically healthy are more comfortable disclosing even common minor symptoms of somatic distress, or that they may be more aware of their general physical health functioning.

More importantly, however, trauma exposure significantly enhanced reports of somatic malaise. These results confirm the findings of a number of previous empirical studies highlighting the deleterious effects of trauma exposure on physical health as measured by a range of physical health outcomes (Campbell, 2002; Elliott et al., 2009; Hickman et al., 2013, Kendall-Tackett & Klest, 2008; Martin et al., 2008; Schnurr & Green, 2004; Woods et al., 2008). This study extends the literature by showing that trauma exposure is also a significant predictor of one's subjective experience of overall health above and beyond important demographic contributions, and is not limited to incidence of diagnosed disease or other commonly reported chronic health problems following trauma exposure (Felitti et al., 1998; Kendall-Tackett & Klest, 2008).

It was also hypothesized that a range of numbers of trauma exposures would contribute significantly to healthcare utilization (Hypothesis 1b). However, the results of the regression analyses do not support this hypothesis. Neither the demographic covariates of ethnicity, income, and number of people in the household nor exposure to trauma were significant predictors of healthcare utilization patterns in this sample of women. It may be that healthcare utilization is a more complex construct that is difficult to comprehensively examine. The findings of this study may suggest differences in the manner in which women seek specialty OB/GYN preventive care versus treatment for health problems in primary care.

It is significant to the further understanding of healthcare utilization as a construct that demographic factors did not explain a significant amount of variance in healthcare utilization in

this sample. Varying models of healthcare utilization have emphasized a diverse range of factors thought to affect patterns of utilization (Clouse & Sherif, 2008; Deykin et al., 2001; Haley et al., 1998; Iverson et al., 2011). These models have consistently shown lower SES, minority ethnic status, and lower educational status, along with other factors to be associated with less healthcare utilization for a number of reasons, including limited access, stigmatization fears, and limited awareness of available services. However, these are also the same demographic features associated with increased rates of trauma exposure, further complicating the ability to determine patterns of healthcare utilization in traumatized individuals whose help-seeking behaviors may be influenced by factors that also increase the risk for trauma exposure and subsequent traumatic distress (Brewin et al., 2000; Deykin et al., 2001; Iverson, 2011).

Although there is a preponderance of evidence illustrating the strong associations between trauma and subsequent physical health problems and diseases, there have been few studies that have investigated how the increased risk of physical distress resulting from trauma affects healthcare utilization (Deykin et al., 2001; Kendall-Tackett, 2009; Martin et al., 2000; Hien et al., 2009). The results of this study suggest a more complex relationship with seeking medical attention in those who have experienced trauma. Though previous studies have shown that traumatized individuals seek significantly more healthcare than those who have not experienced trauma, there has also been evidence that traumatized women, in gynecological settings in particular, may be less likely to seek necessary care (Campbell, 2002; Hien et al., 2009).

It is also important to note that this sample evidenced relatively low levels of traumatic distress (PSS) and rather high levels of resilience, and may not have experienced a type or level of health concerns that required as many OB/GYN physician visits. It was noted that the

majority of reported visits were of a preventive or routine nature, suggesting that this sample did not seek significantly more OB/GYN treatment outside of appropriate and standard annual care. It may be that those individuals who chose to participate in this study utilized the specialty practice primarily for focused preventive and routine care.

It was next hypothesized that traumatic distress (PSS) would significantly enhance the prediction of somatic malaise following trauma exposure, such that levels of somatic malaise would be better explained with the addition of traumatic distress in the predictive model (Hypothesis 2). Indeed, trauma exposure explained a significant amount of variance in reported levels of somatic malaise above and beyond that of demographic covariates (Step 1). Trauma exposure also accounted for a significant amount variance in levels of traumatic distress when controlling for covariate effects (Step 2). Further, the additional consideration of a range of traumatic distress better explained the variance in somatic malaise than that accounted for by trauma exposure and other covariates alone (Step 3). However, while consideration of traumatic distress significantly enhanced the prediction of somatic malaise, it did not better explain the significant amount of variance in somatic malaise initially explained by trauma exposure, which remained a significant predictor even when traumatic distress was included in the predictive model.

As is consistent in previous studies, minority ethnic status, lower income and fewer people in the home were associated with higher levels of traumatic distress. Both minority ethnicity and lower income are consistently associated with increased risk for a range of mental health disorders including PTSD and other symptomatic sequelae of trauma exposure (APA, 2000; Brewin et al., 2000; Luthar, 1991; Taft et al., 1999). In keeping with an established literature showing the protective role of social support in one's experience of psychological

health (Anderson & Anderson, 2003; Bonanno et al., 2010; Luthar, 1991; Rutter, 1985), this study's findings may indicate that low household social support was associated with higher levels of traumatic distress, suggesting that, in this sample of women seeking OB/GYN services in a private practice, intimate social support may contribute to better overall psychological and physical functioning.

It is important to emphasize that this sample reported overall low levels of traumatic distress, yet the number of posttraumatic stress symptoms (PSS) reported did enhance the prediction of somatic malaise. This finding is an important contribution to the existing literature investigating the role of traumatic distress on physical health, in that it shows that non-clinical levels of distress have a significant impact on one's overall health perceptions. The results of this study meaningfully contribute to the accumulation of empirical evidence over the past several decades that have investigated the phenomenology of PTSD and associated sequelae of traumatic experience (Clark & Ehlers, 2000; Felitti et al., 1998; Foa et al., 1992; Kendall-Tackett, 2009; Martin et al., 2008; Schnurr & Green, 2004). The current findings also highlight further the potential impact of a broad range of traumatic events on psychological functioning and subsequent overall physical health perceptions.

The results also contribute to the growing literature investigating exposure to multiple traumatic events (i.e. polyvictimization) as perhaps the most significant predictor of long-term psychological distress and physical health outcomes (Elliott et al., 2009; Hickman et al., 2013; Sledjeski et al., 2008), rather than the nature of the trauma event itself (e.g. sexual abuse, physical abuse), time of exposure (e.g. childhood vs. adulthood, chronicity), or familial/parental characteristics (e.g. psychopathology, parent-child relationship) (Chartier, Walker, & Naimark, 2010; Dong, Anda, Dube, Giles, & Felitti, 2003) . Although traumatic distress (PSS) was an

important enhancing predictor of somatic malaise, it did not significantly reduce the impact of trauma exposure itself in predicting subjective experience of health. This is especially salient given the relatively high rates of trauma exposure and polyvictimization reported by this sample, and comparatively high level of psychological functioning given trauma histories. The results further highlight the importance of the cumulative impact of trauma exposures themselves rather than the nature of any one type of trauma in predicting physical health outcomes. As in previous studies, additional research is needed to fully understand the relations between trauma, distress, and health outcomes, as well as better understand the mechanisms of those relations.

The next analyses examined the role of resilience as a moderator in the relation between trauma exposure and physical health outcomes. It was hypothesized that resilience would not only be a significant contributor to the variance in somatic malaise, but that the relation between trauma exposure and somatic malaise would vary as a function of resilience (Hypothesis 3). However, while resilience was a significant predictor of somatic malaise, it did not affect the impact of trauma exposure alone. Resilience has a strong impact on self-reported somatic symptoms and functional physical malaise, but does not significantly affect the association between trauma exposure and somatic malaise. The Connor-Davidson Resilience Scale (CD-RISC, 2003) captured the participants' perceptions of how they cope with and accept some negative effects of previous traumatization, and subsequently manage any additional negative impact on overall mental and physical functioning. Again, this finding suggests that resilience has an effect on how one cognitively perceives and copes with their experience of physical health, but one's level of resilience does not affect the relation between trauma exposure and perceptions of somatic symptoms and physical malaise.

Resilience was examined as a significant contributor to variance in traumatic distress (PSS), and as a moderator in the relation between trauma exposure and traumatic distress in the final hypothesis (4), where it was believed that levels of resilience would influence the relation between trauma exposure and traumatic distress. Resilience was a significant predictor of traumatic distress, with higher levels of resilience predicting lower levels of traumatic distress. However, the interaction of trauma exposure and resilience did not predict traumatic distress (PSS), suggesting, for instance, that high levels of resilience do not reduce potential negative effects of trauma exposure itself on subsequent traumatic distress. This finding was not expected based on previous findings that higher levels of resilience predict lower levels of PTSD and associated traumatic distress (PSS) (Bonanno, 2004; Campbell-Sills et al., 2006; Chartier et al., 2010; Connor & Davidson, 2003; White, 2009). However, these results are consistent with the finding of trauma exposure contributing significantly more variance to physical health outcomes than the effects of traumatic distress, and the finding that the negative impact of trauma exposure is not significantly reduced by resilient responding. It appears that while the level of resilience may impact the level of traumatic distress experienced, it does not affect the initial negative effects of trauma exposure itself. This finding again suggests that resilience may be a cognitive construct that operates at more of a process level to affect how one copes with the effects of traumatization. The impact of trauma exposure on traumatic distress may not vary for high versus low levels of resilience, but resilience may ameliorate the manner in which one experiences the negative sequelae of traumatization, both psychological and physical.

Conclusions

In summary, the results of this study appear to center around several main themes. It is first important to note that trauma exposure was found to be a very common experience in this

female community sample, with many of the participants reporting multiple traumatic events in their lifetimes. This high frequency of polyvictimization is a particularly salient finding, as number of trauma exposures was found to be the most predictive variable when examining the relation between exposure, traumatic distress (PSS), and physical health experience, consistent with previous studies (Chartier et al., 2010; Dong et al., 2003; Dube, Anda, Dong, Giles, & Felitti, 2003; Felitti et al., 1998; Hickman et al., 2013). Participants' reported trauma histories revealed that, in this sample of women seeking care at a private OB/GYN practice, traumatic exposure occurs across the lifespan, and those who experienced trauma in childhood were much more likely to experience trauma as an adult, often within similar contexts of interpersonal victimization. These findings are consistent with previous epidemiological studies and recent investigations of polyvictimizations showing the significantly increased risk of repeated traumatizations among those exposed in childhood (Elliott et al., 2009; Finkelhor et al., 2009; Hickman et al., 2013), particularly when early trauma exposure is of an interpersonal nature.

Another salient aspect of this study was the finding that participants in this study indicated relatively low levels of traumatic distress (PSS) when compared to other similarly trauma-exposed samples reporting a wider range, including clinical levels of psychological distress (Briere & Scott, 2006; Briere & Jordan, 2009; White, 2009). Further, this sample reported comparatively high levels of resilience compared to previous studies (Connor & Davidson, 2003; White, 2009), indicating that overall, this sample is relatively high functioning in terms of psychological health as compared to similarly trauma-exposed samples (Briere & Jordan, 2009; Connor & Davidson, 2003; White, 2009). It is important to note, however, that this study's participants were sampled from a middle-aged adult community population, where previous studies have utilized clinical (Briere & Jordan, 2009; Connor & Davidson, 2003) and/or

convenience college-aged samples (White, 2009) where participants may have reported more psychological distress due to clinical diagnosis or closer proximity of exposure to the event.

Although the level of psychological distress reported in this sample was in the non-clinical range, participants reported moderate levels of physical distress associated with somatic symptom symptoms and functional impairment due to physical malaise. However, reported somatic malaise was primarily predicted by level of trauma exposure. While traumatic distress significantly enhanced the prediction of somatic malaise following trauma exposure, the reported level of trauma exposure was a significantly more powerful influence on subjective experience of physical health.

It is important to highlight that traumatic distress (PSS) helped better explain the relation between trauma exposure and somatic malaise even though mean levels of psychological distress were sub-clinical. This finding provides a significant addition to the literature regarding the impact of trauma on physical health, as it shows that subclinical trauma-related psychological distress (PSS) has a negative impact on one's overall physical health, extending the findings of previous studies that have focused primarily on the impact of clinically-diagnosed PTSD on physical health. These findings provide evidence that a clinically significant level of distress is not necessary for there to be a negative impact on long-term physical functioning following trauma exposure.

Resilience emerged as a salient variable of interest given findings that it acts as a significant predictor of reported somatic and posttraumatic stress symptoms, but not as a moderator in the relation between trauma exposure and somatic symptoms, or between trauma exposure and traumatic stress symptoms (PSS). While higher levels of resilience are significantly associated with fewer somatic symptoms and less functional impairment due to

physical malaise, and lower levels of psychological distress, respectively, resilience does not affect the already significant impact of trauma exposure in predicting physical or psychological outcomes. These findings indicate that resilience is more of a response process that perhaps ameliorates the negative effects of traumatic distress and/or negative experiences of physical health. Cognitively resilient processing of the effects of physical and psychological distress may contribute to improved coping with experienced distress, but does not necessarily prevent the experience of psychological and physical distress following trauma.

Overall, perhaps the most important finding is that even those who are functioning relatively well psychologically still report some level of distress that has a significant impact on their subjective experience of health. While this level of traumatic distress (PSS) does not impact report of somatic symptoms and functional impairment due to physical malaise more than the effects of the trauma exposure itself, it does exacerbate traumatization's negative impact on one's experience of physical health. Given the breadth of literature showing the significance of PTSD as a mediator in the relation between trauma exposure and physical health problems, this study's findings argue for further investigation of subclinical levels of psychological distress in its impact on physical health outcomes

Limitations

Given the primary goal of the study to investigate the role of traumatic distress in predicting physical health outcomes, there was an average level and limited range of psychological functioning among participants, and the generalizability of findings consequently was limited to high functioning individuals reporting few psychological symptoms. Although there was a range of traumatic events reported, the average reported psychological distress was well below reported clinical cutoffs; further, average resilience scores were well above those

reported for previously assessed traumatized samples. While the results were not as robust as expected, they still evidenced significant findings in showing that even minimally elevated levels of traumatic distress are associated with reports of somatic symptoms and functional impairment due to physical malaise.

Results may have also been limited by some of the methods used to assess physical health outcomes, particularly in the use of more global measures of physical distress in the PILL (Pennebaker, 1982) and BRFSS (CDC, 2011). The PILL asked participants to report experienced frequency of commonly reported somatic symptoms, while the items of the BRFSS inquired about functional impairment as a result of physical and/or psychological distress. Although these measures were excellent to examine the experience of general physical malaise and were both conceptually and statistically related, their content may not have been specific enough to accurately assess actual presence of diagnosed physical diseases (Chartier et al., 2010).

Further, this study's sampling approach was very broad in sampling a wide range of traumatic events, rather than circumscribing trauma history assessment to events historically viewed as "most damaging" (e.g. child sexual and physical abuse, sexual assault, intimate partner violence) (Briere & Jordan, 2004; 2009; Campbell & Lewandoski, 1997; Eadie et al., 2008; Martin et al., 2008; Suris & Lind, 2008). It may be that this study's broader assessment of trauma to include adverse childhood events, and use of generalized measures of physical functioning impacted results, limiting the conclusions that may be drawn.

It is also important to note that a comprehensive assessment of healthcare utilization following trauma exposure may not have been provided by the measures and methods used in this study, as this sample's participants were comprised of a convenience sample of women

seeking OB/GYN care at a private practice within the past year. Although some participants (n < 5) did not receive care at this practice within the time frame of this study, it is possible that they obtained health services through another provider whose data was not available for inclusion. As a result, available data regarding healthcare utilization was limited by an inability to determine the full range of healthcare utilization for this sample. It may be useful in future studies examining similar constructs to inquire about additional visits to primary care providers, ERs, and other specialty physicians (Chartier et al., 2010). The study was also limited in that, by sampling women who were already presenting for care at a private practice, there was no way to recruit trauma-exposed women who were not utilizing health services, or perhaps obtaining them elsewhere. Therefore, it is important to recognize that the implications of this study may only be generalized to those women who are seeking OB/GYN care at a private practice.

Contributions

There are several aspects of this study that contribute uniquely to the literature on the relation between trauma and physical health outcomes. Primarily, the design of the study examined the role of subclinical trauma-related psychological distress in mediating the relation between trauma exposure and physical health problems. The majority of empirical studies of this relation thus far have examined the impact of trauma-related psychological symptoms with severity that would meet criteria for diagnosis of PTSD in examining the relation between trauma and physical health. However, investigators in these studies did not explore the potential of subclinical psychological distress that does not meet criteria for a PTSD diagnosis (e.g. PSS) to affect physical health problems. Although there have been a number of studies that have shown wide variability in responses to trauma (Bonanno et al., 2010; Briere & Jordan, 2004; 2009; Felitti et al., 1998; van der Kolk et al., 2005; Wachen et al., 2013; White, 2009), including

symptomology strongly linked to trauma but not necessarily meeting criteria for a diagnosis of PTSD, there remain few studies in the current literature regarding the impact of a full range of traumatic distress (PSS) on long term physical health following trauma (Wachen et al., 2013). This study is among the first to examine the role of a full range of posttraumatic distress on health outcomes. Others have explored the role of posttraumatic stress symptoms in the relation between trauma exposure and physical health problems in a combat veteran population, finding that PSS severity mediated the relation between combat exposure and physical health symptoms (Wachen et al., 2013). This study extends those findings in a female OB/GYN private practice sample, showing that an average range of traumatic distress (PSS) enhances the prediction of somatic symptom reporting and functional impairment due to physical malaise following trauma exposure.

This is also the one of the first studies to use an empirically-established measure to evaluate the possible role of resilience in the relation between trauma and physical health outcomes. Previous studies have examined positive psychological factors (e.g. positive mood, optimism) associated with concepts of resilience (Matheson et al., 2008; McIntosh et al., 2011; Nygren et al., 2005). However, no studies examining the relation between trauma and health have specifically evaluated the role of resilience as a process or construct in the expanding literature on the relation between trauma and health. This project investigated the role of resilience as a unitary construct consisting of several positive psychological factors (e.g. commitment, action-oriented problem solving, perception of change as challenge, strong self-esteem, strong emotional bonds) as it affects the relation between trauma and physical health (Connor & Davidson, 2003). This conceptualization of resilience reflects the work of several prominent researchers investigating the construct of resilience as a process variable (Bonanno et

al., 2010; Connor & Davidson, 2003; Lepore & Revenson, 2006; Mancini & Bonanno, 2006). The use of this conceptualization of resilience in this study makes an important contribution to furthering the understanding of the relation between trauma and health, in that it marks the first consideration of resilience as a unitary process construct affecting the relation between trauma exposure and the development of physical health problems.

Another unique aspect of this study's design was the use of subjective health ratings as a measure of somatic distress and functional impairment (Somatic Malaise), rather than a focus on incidence of disease processes. This allowed for the assessment of somatic distress outside the presence of disease, and of daily functioning and self-care activities (e.g. work, diet, exercise). The use of this measurement may have provided a clearer assessment of impairment or disability as a result of physical distress that could lead to disease process in the future, rather than incidence of existing disease that may not thoroughly capture the disease process' effect on functional impairment. It is also important to note that previous researchers have found subjective ratings of health to be more accurate in predicting mortality than objective measures of health, further highlighting the benefits of using subjective health measures (Chartier et al., 2013; Moller, Kristensen, & Hollnagel, 1996)

This study's use of subjective health measures is an important point to consider, as there is significant variability in the subjective experience of disease, pain, and distress that may affect the ability to maintain adaptive physical and psychological functioning. It may be that those who have experienced trauma are at risk for experiencing a higher level of physical distress, and elevated levels of traumatic distress (PSS) may contribute to an increase in the functional impairment from experienced somatic distress. This increased functional impairment resulting from somatic malaise may subsequently increase the risk for incidence of physical disease.

Experience of physical distress prior to or in the absence of a medical diagnosis is very difficult to manage, both as a result of an inability to determine an organic etiology, as well as gaps in the insurance industry that do not authorize testing and treatment without a classifiable diagnosis indicating a need for such intervention.

Some of this variability in experience of somatic distress may be due to external factors such as age, ethnicity, and economic resources, as shown in this study, but it may also be strongly affected by psychological and neurological factors (Kendall-Tackett, 2009; Matheson et al., 2008; McEwen, 2000; Steptoe et al., 2009). This study's focus on the role of psychological symptoms and processes in the relation between trauma and health highlights the importance of considering how these factors affect subjective experiences of health and well-being. It may be that psychological factors influence the manner in which disease, pain, and other common somatic symptoms are experienced, such that some individuals with higher levels of psychological distress are more likely to report significant somatic distress and functional impairment from physical ailment than those with lower levels of psychological distress. Further, this increased risk for disability from physical distress may increase the risk for disease process, and it may be that addressing the negative impact of deleterious psychological processes through intervention could reduce the incidence of diagnosed physical disease.

Where previous studies have investigated healthcare utilization based on symptoms reported, diagnoses provided, and/or cost of service provided (Hien et al., 2009; Looper & Kirmayer, 2002; Turk & Okifuji, 2002; Solomon & Davidson, 1997), this study considered multiple aspects (e.g. number of visits, physician diagnoses, and medical procedures) of healthcare utilization patterns. The consideration of multiple aspects of healthcare utilization allows for a more comprehensive assessment of healthcare utilization that provides more

information than diagnoses provided and money or time spent for a given individual alone. A composite variable comprised of multiple aspects of any given office visit, as used in this study, allows for consideration of several factors representing a unitary construct reflecting an individual's overall presentation to the physician.

Finally, and perhaps most importantly, this project sampled a particularly unique population when recruiting participants for this study. Women presenting to their private obstetrics and gynecology (OB/GYN) physician for both routine and focused care are an ideal population for sampling the impact of trauma for several reasons. Women are significantly more likely to be exposed to trauma, particularly interpersonal violence, which presents a higher risk for negative health effects than for men exposed to trauma. Additionally, following trauma exposure, women are much more likely to develop psychological distress, and are more likely than men to be diagnosed with PTSD. Further, many women present to an OB/GYN at least once per year, where their physicians are likely to come into contact with many of the physical outcomes associated with trauma, and particularly interpersonal violence exposure (Clouse & Sherif, 2008). Utilization of a community outpatient sample provided an opportunity to investigate the relation between trauma and physical health in a non-clinical population, and also allowed for a setting in which to observe the impact of a range of trauma on physical health in a general at-risk population. Additionally, recruitment of participants from a private OB/GYN practice allowed potential access to a diverse group of women, both in terms of demographics and range of life experiences, although those women who chose to participate made up a less diverse sample when compared to the population served by this practice as a whole.

Previous studies investigating the relation between trauma and physical health have used a range of populations. Several studies have focused on mostly veteran populations (Boscarino,

2008; King et al., 1998; Suris & Lind, 2008; Taft et al., 1999; Wachen et al., 2013), while others have utilized population-based community surveys that assess for a wide range of conditions including trauma history and physical health conditions. Some studies have used female populations with specific trauma histories and varying demographics (e.g. college–age females with history of sexual assault (Eadie et al., 2008), female victims of domestic violence (Martin et al., 2008), or military sexual trauma (Suris & Lind, 2008)) to examine the impact of a specific trauma on long-term physical health. In contrast, this study's population sampling approach was inclusive across ages, trauma histories, and physical health conditions and casted a wide net in hopes of obtaining a diverse sample of women.

The findings of this study contribute to the existing literature regarding the relation between trauma and physical health, and provide implications for future research. Expansion of these findings using more detailed physical health measures, along with a comprehensive assessment of subclinical and trauma-related psychological distress, may add further understanding among researchers and clinicians of how trauma exposure affects long-term physical health outcomes. It is also essential to replicate the results in a more diverse community or general health care setting, where findings may be more generalizable outside a female community sample recruited in an obstetrical and gynecological setting.

Future Directions

The results of this study provide several future directions for subsequent examinations of the relation between trauma exposure and physical health outcomes. It may be useful to target a greater number of women within OB/GYN samples to determine if there is variability in distress responding across samples that have experienced different trauma types (e.g., interpersonal vs. non-interpersonal trauma types, childhood vs. adulthood exposure). Further, it is very important

to sample a range of community settings for future studies in order to gain access to a more diverse population that will allow results to be more generalizable. It may also be useful to examine variability across age groups and/or ethnic and economic contexts, to determine the presence of other factors that may contribute to an increased risk for physical health problems following trauma. This is particularly relevant for this sample, which was largely Caucasian. It would be useful in future studies to sample populations with more ethnic minority representation, so that meaningful implications regarding the influences of demographic covariates on the relation between trauma exposure and physical health problems may be generalizable to ethnically heterogeneous populations.

Future studies may benefit from sampling a more diverse medical population, in perhaps a general medical practice such as a community clinic or primary care facility that provides access to individuals presenting for a significantly wider range of physical health problems. It may also be useful to gather a self-report of utilization of a range of health services to gain access to information regarding healthcare provided outside the sampling environment (Chartier et al., 2013). Another potentially valuable sampling environment may be urgent care clinics and emergency rooms, where patients may often present in acute distress shortly following traumatization. Not only might these populations present in such settings with more serious physical health problems, there may also be a potential for reporting of higher levels of traumatic distress. Emergency rooms also serve as a default primary care clinic for patients who have limited access to adequate healthcare and insurance coverage. It may be that these individuals are at a particular risk for higher levels of both psychological and physical distress for many reasons, including limited income, housing, and overall poor access to basic healthcare. It may also be useful to recruit participants from non-medical community settings, particularly if one is

inquiring about subjective experiences of health versus physician diagnosed health problems. Such an approach would not only allow access to a much more diverse population, but also provide an opportunity to gain information regarding healthcare utilization from participants who are not actively seeking health services (Chartier et al., 2013).

Based on this study's findings that even subclinical levels of traumatic distress can significantly predict experience of somatic distress and functional impairment due to physical malaise, and that this distress mediates the predictive relation between trauma exposure and the subjective experience of physical health, it important to explore more extensively the potential effects of a range of traumatic distress (PSS) on physical health outcomes. Previous studies have established the role of PTSD as a predictor and mediator of the relation between trauma exposure and a range of physical health indicators (Boscarino, 2008; Schnurr & Green, 2004). Further investigation into the predictive impact of variable traumatic distress response would do much to expand the existing literature and contribute to a better understanding of the relation between trauma and physical health.

It would be a significant contribution to the literature to extend previous findings of increased risk for life-threatening disease and chronic health problems following trauma exposure associated with PTSD to risk for physical disease and health problems with subclinical levels of traumatic distress (PSS) (Wachen et al., 2013). A more thorough assessment of incidence of disease may provide further insight into the relation between the level of traumatic distress severity and resulting severity of risk for health problems. It may also be useful to assess for self- reported gynecological symptoms in a trauma-exposed female community sample, as access to those data may have been limited from chart review due to underreporting from both

patient and physician. It may be that more useful health information may be gathered from individuals' self-report outside a healthcare setting (Chartier et al., 2013; Moller et al., 1996).

Future research may consider further how trauma-related psychological processes impact the experience of physical distress and potential for subsequent incidence of disease to determine whether focused, early psychological intervention could reduce the risk for medical disease following trauma exposure. An existing literature for psychological approaches to interventions for chronic pain and other somatoform disorders (Looper & Kirmayer, 2002; Turk & Okifuji, 2002) explores the contribution of cognitive and behavioral factors to the experience of distress, a direction that could prove valuable for researchers investigating the relation between trauma and physical health problems.

In terms of furthering an understanding of the relation between resilience and physical health outcomes following trauma, it would be very interesting to explore how resilience influences self-care and other preventive health behaviors (e.g. screenings for diabetes, hypercholesterolemia, hypertension, cancer; diet; exercise), particularly as there appeared to be some interaction between resilience and trauma exposure in predicting healthcare utilization. It may be that resilience functions as a moderator in the cognitive and behavioral motivation to engage in appropriate, adaptive preventive healthcare behaviors. This finding would contribute significantly not only to the resilience, trauma, and healthcare literature, but would also provide important clinical implications for primary care psychology and integrated healthcare as a whole in terms of intervention and prevention of chronic physical health problems.

Further investigation is needed among those women in a community population who may not access appropriate healthcare both for preventive care and when needed for treatment of physical health problems. It would be interesting to explore what, if anything, may be qualitative

different about those women who, for whatever reason, do not seek appropriate preventive care and/or treatment for health problems when compared to women who demonstrate appropriate healthcare utilization. Access to this information could be gathered by attempting to reach those patients whose medical records have been flagged as overdue for annual and/or follow-up screening, either through phone, letter, or email survey. While this focus takes the direction of the trauma and healthcare literature in a very different direction by examining factors keeping people from utilizing healthcare appropriately when needed, it is a very important question when considering the deleterious impact of poor preventive health behaviors on one's overall long-term physical health and on the landscape of healthcare provision as a whole.

Perhaps most importantly, this study points to the necessity of researchers in the field of resilience to develop a consensus on the nature and phenomenology of the construct. In order for effective empirical investigation of resilience to continue, there must be a determination of the best manner in which to measure its phenomenology, whether by a series of measures of positive functioning, or through a more comprehensive unitary measure. The upcoming 29th annual meeting of the International Society for Traumatic Stress Studies (November, 2013), titled "Resilience After Trauma: From Surviving to Thriving," aims to make significant efforts toward developing a consensus both on a unified definition and conceptualization of resilience. This important milestone in the field of trauma and resilience will make a significant step towards developing a strong literature on the phenomenon of resilience.

However, the operationalization of resilience in studies that have used the CD-RISC has been inconsistent, used to assess both outcomes and variable processes (Almedom & Glandon, 2007; Connor & Davidson, 2003; Connor et al., 2003; White, 2009). It is important that potential conceptual resilience measures be considered for consensus on utilization in empirical

studies of resilience, so that findings may be replicated and generalizable, with theoretical and practical agreement on the nature of the phenomenon itself. The CD-RISC has shown consistent reliability and validity in the studies in which it has been utilized (Almedom & Glandon, 2007; Connor & Davidson, 2003; Campbell-Sills et al., 2006; White, 2009), and has provided significant contributions to the existing literature. The developers of the CD-RISC, as well as several researchers utilizing the measure in studies (Connor & Davidson, 2003; Campbell-Sills et al., 2006; White, 2009), have conceptualized the CD-RISC as an assessment of cognitive aspects of resilience, where the construct has been described as a means of interpreting, managing, and overcoming the impact of negative life events. It is essential to a meaningful expansion of the resilience literature to move towards a unified conceptualization that enables investigators to effectively communicate their findings. Not only will a unified conceptualization of resilience significantly contribute to a better understanding of variable psychological responses following trauma exposure, but it will also provide an additional foundation from which to explore the impact of resilience and variable posttraumatic symptomatic responding on physical health outcomes following trauma.

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Appendix A. Questionnaire Packet

CONSENT TO PARTICIPATE IN A RESEARCH STUDY

TITLE: Examining the Relations Among Trauma, Distress, Resilience, and Physical Health

Investigator(s): Elizabeth Chaisson M.A.
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DESCRIPTION: As a voluntary participant, you will be among approximately 200 individuals who will be asked to provide information about their experience of stressful life events, as well as how different factors have impacted long term physical health outcomes. This study is designed to investigate both positive and negative outcomes following negative life events. This information will be obtained by having you complete a questionnaire online through SurveyMonkey. Information regarding your past year's doctor's office visits will also be accessed with permission from your physicians.

RISKS OF PARTICIPATION: On rare occasions a few individuals may find some of the questions to be difficult to complete due to experiences in their own personal history. If you find a question to be distressing, you may skip it without penalty.

BENEFITS: Your participation in this study will not provide any direct benefits to you. However, there are several indirect benefits to your participation in this study. You will be entered in a drawing for reward compensations. You will also have opportunity to learn more about relations between past traumatic experiences, mental health, and physical health, which may help you understand more about your overall health. General information about group results will also be shared with physician at Lee Obstetrics and Gynecology, P.A. to help them meet the needs and serve their patients more effectively.

VOLUNTARY PARTICIPATION AND RIGHT TO WITHDRAW: Your participation in this research is completely voluntary and you are free to discontinue the survey at any time. Also,

you are not required or obligated to complete the questionnaire; it will not affect your access to services at Lee OB/GYN in any way.

CONFIDENTIALITY: Your signed consent form will be kept separate from the completed questionnaire. As soon as the medical information and the questionnaire responses are correlated, their patient ID number will be removed from the data and a random number assigned, thus making your records completely anonymous. Results from the research will be reported as aggregate or group data.

INFORMED CONSENT: I have read the description, including the nature and purposes of this study, the procedures to be used, the potential risks and benefits, as well as the option to withdraw from the study at any time. I have had any questions regarding the study answered, and I believe I understand what is involved. My completion of the survey indicates that I freely agree to participate in this research study.

Electronic Signature (PATIENT ID #) Date

DEBRIEFING FORM

Title: Examining the Relations Among Trauma, Distress, Resilience, and Physical Health

Investigator(s):	Elizabeth Chaisson M.A.	Iroshi (Ro) Windwalker, CIP
	Patricia Petretic, Ph.D.	Research and Sponsored Programs
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You have just participated in a study that is designed to examine the relations between traumatic experiences, emotional distress, and physical health problems. Traumatic and other negative life events are common occurrences that have the potential to lead to negative outcomes, including post traumatic stress disorder, depression, anxiety, and substance abuse problems. Experience of emotional distress can place a burden on the body's stress response and immune systems, which may then lead to the development of chronic health problems.

This research examines how women's health is affected by the negative events that have occurred in their lives. Specifically, this study investigates pathways that may impact physical health following negative or traumatic life events, both in terms of the negative impact of emotional distress, as well as the potentially beneficial effects of resilience and positive coping. Research suggests that a number of factors may be important in understanding the relation between trauma and physical health, including how symptoms of emotional distress such as depression, disrupted sleep and appetite, and poor efforts at coping contribute to physical health problems.

Thank you for your participation. The results of this research will help us to better understand the connection between stressful life events and physical health problems. In rare cases, participants may experience adverse effects following completion of this study. Some of these effects may include symptoms of depression, anxiety, or posttraumatic stress. Such symptoms may include, but are not limited to, the following: feelings of hopelessness, sleep disturbance, appetite change, increased tension, fatigue, flashbacks of traumatic events, suicidal ideation, or

any other changes in mood or mental status from prior to participation. We urge you to contact any of the resources listed below if you experience any of these changes.

1.	Clinical Psychologists, P.C.	(334) 821-3350
2.	Auburn University Psychological Services Center	(334) 844-4889
3.	Crisis Center Hotline	1-800-273-8255 / (334) 821-8600
4.	East Alabama Mental Health	(334) 742-2700

PLEASE DO NOT DISCUSS YOUR PARTICIPATION WITH OTHER PEOPLE WHO MIGHT PARTICIPATE IN THIS STUDY!

Demographics

1. What is your age? _____

2. What is your ethnicity?

- White/Caucasian
- Black/African American
- Hispanic/Latino
- Asian/Asian American
- Native Hawaiian or other Pacific Islander
- American Indian or Alaska Native
- Other (please specify)

3. What is your marital status?

- Single/Never Married
- A member of an unmarried couple (Dating/Cohabitating/Engaged)
- Married
- Widowed
- Separated
- Divorced

4. How many children under 18 are living in your house? _____

5. What is the total number of people living in your household? _____

5. What is the highest grade or year of school you completed?

- Never attended school or only attended kindergarten
- Grades 1 through 8 (Elementary)
- Grades 9 through 11 (Some high school)
- Grade 12 or GED (High school graduate)
- College 1 year to 3 years (Some college or technical school)
- College 4 years or more (College graduate)
- Post Graduate/Professional School

6. Are you currently…?

- Employed full time
- Employed part-time
- Out of work for more than 1 year
- Out of work for less than 1 year
- A Homemaker
- A Student

- Retired
- Unable to work

7. Is your annual household income from all sources—

- Less than $25,000 ($20,000 to less than $25,000)
- Less than $20,000 ($15,000 to less than $20,000)
- Less than $15,000 ($10,000 to less than $15,000)
- Less than $10,000
- Less than $35,000 ($25,000 to less than $35,000)
- Less than $50,000 ($35,000 to less than $50,000)
- Less than $75,000 ($50,000 to less than $75,000)
- $75,000 or more

Behavioral Risk Factor Surveillance System-Modified

1. Would you say that in general your health is:

- Excellent
- Very Good
- Good
- Fair
- Poor

2. Now thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?

- Less than 5 days
- 5 – 10 days
- 10 – 15 days
- 15 – 20 days
- 20 – 30 days

3. Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?

- Less than 5 days
- 5 – 10 days
- 10 – 15 days
- 15 – 20 days
- 20 – 30 days

4. During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work, or recreation?

- Less than 5 days
- 5 – 10 days
- 10 – 15 days
- 15 – 20 days
- 20 – 30 days

5. During the past 30 days, for about how many days have you felt you did not get enough rest or sleep?

- Less than 5 days
- 5 – 10 days
- 10 – 15 days
- 15 – 20 days
- 20 – 30 days

6. Have you ever been told by a doctor that you have diabetes?
If "Yes "Was this only when you were pregnant?"

- Yes
- Yes, but told only during pregnancy
- No
- No, pre-diabetes or borderline diabetes
- Don't know / Not sure

7. Has a doctor, nurse, or other health professional EVER told you that you had any of the following?

(Ever told) you had a heart attack, also called a myocardial infarction?

- Yes
- No
- Don't know / Not sure

(Ever told) you had angina or coronary heart disease?

- Yes
- No
- Don't know / Not sure

(Ever told) you had a stroke?

- Yes
- No
- Don't know / Not sure

(Ever told) you have high blood pressure?

- Yes
- Yes, but female told only during pregnancy
- No
- Told borderline high or pre-hypertensive
- Don't know/Not sure

8. Blood cholesterol is a fatty substance found in the blood. Have you ever had your blood cholesterol checked?

- Yes

- No
- Don't know/Not sure

If Yes: About how long has it been since you last had your blood cholesterol checked?

- Within the past year (anytime less than 12 months ago)
- Within the past 2 years (1 year but less than 2 years ago)
- Within the past 5 years (2 years but less than 5 years ago)
- 5 or more years ago
- Don't know/Not sure

Have you ever been told by a doctor, nurse or other health professional that your blood cholesterol is high?

- Yes
- No
- Don't know/Not sure

9. Have you ever been told by a doctor, nurse, or other health professional that you had asthma?
Yes

- No
- Don't know / Not sure

Do you still have asthma?

- Yes
- No
- Don't know / Not sure

10. Have you EVER been told by a doctor or other health professional that you have some form of arthritis, rheumatoid arthritis, gout, lupus, or fibromyalgia?

- Yes
- No
- Don't know / Not sure

11. How many fruits and/or vegetables do you eat per day?

- 0-1 fruits and/or vegetables

- 2 fruits and/or vegetables
- 3 fruits and/or vegetables
- 4 fruits and/or vegetables
- 5 or more fruits and/or vegetables

12. During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?

- Yes
- No
- Don't know/Not sure

How much physical activity do you do each week?

- 30+ minutes of vigorous physical activity five or more days/week
- 30+ minutes of moderate physical activity five or more days/week or 20+ minutes of vigorous physical activity three or more days/week
- 30+ minutes of mild physical activity five or more days/week or 20+ minutes of moderate physical activity three or more days/week
- 20+ minutes of mild physical activity three or more days/week
- less than 20 minutes of mild physical activity one to three days/week

13. How often do you get the social and emotional support you need (from any source)?

- Always
- Usually
- Sometimes
- Rarely
- Never

14. In general, how satisfied are you with your life?

- Very satisfied
- Satisfied
- Somewhat satisfied/somewhat dissatisfied
- Dissatisfied
- Very dissatisfied

15. In general, how stressful would you say your life is compared to others?

- Not stressful at all
- Somewhat stressful

- Moderately Stressful
- Very stressful
- More stressful than most people I know

The PILL

Pennebaker, J.W. (1982). *The psychology of physical symptoms*. New York: Springer-Verlag.

Several common symptoms or bodily sensations are listed below. Most people have experienced most of them at one time or another. We are currently interested in finding out how prevalent each symptom is among various groups of people. On the page below, write how frequently you experience each symptom. For all items, use the following scale:

A Have never or almost never experienced the symptom

B Less than 3 or 4 times per year

C Every month or so

D Every week or so

E More than once every week

For example, if your eyes tend to water once every week or two, you would answer "D" next to the first item.

_____Eyes water

_____Itchy eyes or skin

_____Ringing in ears

_____Temporary deafness or hard of hearing

_____Lump in throat

_____Choking sensations

_____Sneezing spells

_____Running nose

_____Congested nose

_____Bleeding nose

_____Asthma or wheezing

_____Coughing

_____Out of breath

_____Swollen ankles

_____Chest pains

_____Racing heart

_____Cold hands or feet even in hot weather

_____Leg cramps

_____Insomnia or difficulty sleeping

_____Toothaches

_____Upset stomach

_____Indigestion

_____Heartburn or gas

_____Abdominal pain

_____Diarrhea

_____Constipation

_____Hemorrhoids

_____Swollen joints

_____Stiff or sore muscles

_____Back pains

_____Face flushes

_____Sensitive or tender skin

_____Tightness in chest

_____Skin breaks out in rash

_____Acne or pimples on face

_____Acne/pimples other than face

_____Boils

_____Sweat even in cold weather

_____Strong reactions to insect bites

_____Headaches

_____Feeling pressure in head

_____Hot flashes

_____Chills

_____Dizziness

_____Feel faint

_____Numbness or tingling in any part of body

_____Twitching of eyelid

_____Twitching other than eyelid

_____Hands tremble or shake

_____Stiff joints

_____Sore muscles

_____Sore throat

_____Sunburn

_____Nausea

In the last six months, how many:

_____ Visits have you made to any physician's office for illness

_____ Days have you been sick

_____ Days your activity has been restricted due to illness

Initial Trauma Review – Revised

Briere, J. (2004). Psychological assessment of adult posttraumatic states: Phenomenology, diagnosis, and measurement, 2nd edition. Washington, D.C.: American Psychological Association.

CHILDHOOD QUESTIONS:

1) Before you were age 18, did a parent or another adult ever hurt or punish you in a way that left a bruise, cut, scratches, or made you bleed?

Yes__ No__

If yes: When this happened, did you ever feel very afraid, horrified, or helpless?

Yes__ No__

Did you ever think you might be injured or killed?

Yes__ No__

2. Before you were age 18, did anyone who was 5 or more years older than you ever do something sexual with you or to you?

Yes__ No__

If yes: Did the person ever put their penis, a finger, or an object into your vagina, or anus, or a penis in your mouth?

Yes__ No__

Was this ever done against your will or when you couldn't defend yourself (for example when you were asleep or intoxicated)?

Yes__ No__

When this happened, did you ever feel very afraid, horrified, or helpless?

Yes__ No__

Did you ever think you might be injured or killed?

Yes__ No__

3. Before you were age 18, did anyone who was less than 5 years older than you ever do something sexual to you that was against your will or that happened when you couldn't defend yourself (for example when you were asleep or intoxicated)?

Yes__ No__

If yes: Did the person ever put their penis, a finger, or an object into your vagina, anus, or mouth?

Yes__ No__

When this happened, did you ever feel very afraid, horrified, or helpless?

Yes__ No__

Did you ever think you might be injured or killed?

Yes__ No__

4. Before you were age 18, were you ever involved in a serious fire, earthquake, flood, or other disaster?

Yes__ No__

If yes: When this happened, did you ever feel very afraid, horrified, or helpless?

Yes__ No__

Did you ever think you might be injured or killed?

Yes__ No__

5. Before you were age 18, were you ever involved in a serious automobile accident?

Yes__ No__

If yes: When this happened, did you ever feel very afraid, horrified, or helpless?

Yes__ No__

Did you ever think you might be injured or killed?

Yes__ No__

6. Before you were age 18, did you ever see someone else get killed or badly hurt?

Yes__ No__

If yes: When this happened, did you ever feel very afraid, horrified, or helpless?

Yes__ No__

Did you ever think you might be injured or killed?

Yes__ No__

ADULTHOOD QUESTIONS

1) Since you were 18 or older, has something sexual ever been done to you against your will or when you couldn't defend yourself (for example when you were asleep or intoxicated)?

Yes__ No__

If yes: Did the person ever put their penis, a finger, or an object into your vagina or anus, or a penis in your mouth?

Yes__ No__

When this happened, did you ever feel very afraid, horrified, or helpless?

Yes__ No__

Did you ever think you might be injured or killed?

Yes__ No__

Did this ever happen on a date, or with a sexual/romantic partner or spouse?

Yes__ No__

2) Since you were 18 or older, have you ever been slapped, hit, or beaten in a sexual or marital relationship?

Yes__ No__

ever been shot, shot at, stabbed, or nearly strangled in a sexual or marital relationship?

Yes__ No__

If yes to either: When this happened, did you ever feel very afraid, horrified, or helpless?

Yes__ No__

Did you ever think you might be injured or killed?"

Yes__ No__

3) Since you were 18 or older, have you ever been physically attacked, assaulted, stabbed, or shot at by someone who wasn't a sex partner or husband/wife?

Yes__ No__

If yes: When this happened, did you ever feel very afraid, horrified, or helpless?

Yes__ No__

Did you ever think you might be injured or killed?

Yes__ No__

4) Since you were 18 or older, have you ever experienced combat or fought in a war?

Yes__ No__

If yes: When this happened, did you ever feel very afraid, horrified, or helpless?

Yes__ No__

Did you ever think you might be injured or killed?

Yes__ No__

5) Since you were 18 or older, were you ever involved in a serious automobile accident?

Yes__ No__

If yes: When this happened, did you ever feel very afraid, horrified, or helpless?

Yes__ No__

Did you ever think you might be injured or killed?

Yes__ No__

6) Since you were 18 or older, were you ever involved in a serious fire, earthquake, flood, or other disaster?

Yes__ No__

If yes: When this happened, did you ever feel very afraid, horrified, or helpless?

Yes__ No__

Did you ever think you might be injured or killed?

Yes__ No__

7) If you are an immigrant from another country In the country where you used to live, were you ever tortured by the government or by people against the government?

Yes__ No__

If yes: When this happened, did you ever feel very afraid, horrified, or helpless?

Yes__ No__

Did you ever think you might be injured or killed?

Yes__ No__

8) In this country, have you ever been hit, beaten, assaulted, or shot by the police or other law enforcement officials, during or after an arrest, or at some other time?

Yes__ No__

If yes: When this happened, did you ever feel very afraid, horrified, or helpless?

Yes__ No__

Did you ever think you might be injured or killed?

Yes__ No__

9) Since you were 18 or older, did you ever see someone else killed or badly hurt?

Yes__ No__

If yes: When this happened, did you ever feel very afraid, horrified, or helpless?

Yes__ No__

Did you ever think you might be injured or killed?

Yes__ No__

Adverse Childhood Experiences

While you were growing up, during your first 18 years of life:

1. Did a parent or other adult in the household **often or very often**…

Swear at you, insult you, put you down, or humiliate you?

or

Act in a way that made you afraid that you might be physically hurt?

Yes No

2. Did a parent or other adult in the household **often or very often**…

Push, grab, slap, or throw something at you?

or

Ever hit you so hard that you had marks or were injured?

Yes No

3. Did an adult or person at least 5 years older than you **ever**…

Touch or fondle you or have you touch their body in a sexual way?

or

Attempt or actually have oral, anal, or vaginal intercourse with you?

Yes No

4. Did you **often or very often** feel that …

No one in your family loved you or thought you were important or special?

or

Your family didn't look out for each other, feel close to each other, or support each other?

Yes No

5. Did you **often or very often** feel that …

You didn't have enough to eat, had to wear dirty clothes, and had no one to protect you?

or

Your parents were too drunk or high to take care of you or take you to the doctor if you needed it?

Yes No

6. Were your parents **ever** separated or divorced?

Yes No

7. Was your mother or stepmother:

Often or very often pushed, grabbed, slapped, or had something thrown at her?

or

Sometimes, often, or very often kicked, bitten, hit with a fist, or hit with something hard?

or

Ever repeatedly hit at least a few minutes or threatened with a gun or knife?

Yes No

8. Did you live with anyone who was a problem drinker or alcoholic or who used street drugs?

Yes No

9. Was a household member depressed or mentally ill, or did a household member attempt suicide?

Yes No

10. Did a household member go to prison?

Yes No

Division of Adult and Community Health, National Center for Chronic Disease Prevention and Health Promotion

Connor-Davidson Resilience Scale

(CD-RISC)

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

	Not true at all	Rarely true	Sometimes true	Often true	True nearly all the time
1. I am able to adapt when changes occur.	0	1	2	3	4
2. I have at least one close and secure relationship which helps me when I am stressed.	0	1	2	3	4
3. When there are no clear solutions to my problems, sometimes God or fate can help.	0	1	2	3	4
4. I can deal with whatever comes my way	0	1	2	3	4
5. Past successes give me confidence in dealing with new challenges and difficulties.	0	1	2	3	4
6. I try to see the humorous side of things when I am faced with problems.	0	1	2	3	4
7. Having to cope with stress can make me stronger.	0	1	2	3	4
8. I tend to bounce back after illness, injury, or other hardships.	0	1	2	3	4

	Not true at all	Rarely true	Sometimes true	Often true	True nearly all the time
9. Good or bad, I believe that most things happen for a reason.	0	1	2	3	4
10. I give my best effort, no matter what the outcome may be.	0	1	2	3	4
11. I believe I can achieve my goals, even if there are obstacles.	0	1	2	3	4
12. Even when things look hopeless, I don't give up.	0	1	2	3	4
13. During times of stress/crisis, I know where to turn for help.	0	1	2	3	4
14. Under pressure, I stay focused and think clearly.	0	1	2	3	4
15. I prefer to take the lead in solving problems, rather than letting others make all the decisions.	0	1	2	3	4
16. I am not easily discouraged by failure.	0	1	2	3	4
17. I think of myself as a strong person when dealing with life's challenges and difficulties.	0	1	2	3	4
18. I can make unpopular or difficult decisions that affect other people, if it is necessary.	0	1	2	3	4
19. I am able to handle unpleasant or painful feelings like sadness, fear, and anger.	0	1	2	3	4
20. In dealing with life's problems, sometimes you have to act on a hunch, without knowing why.	0	1	2	3	4
21. I have a strong sense of purpose in life.	0	1	2	3	4

	Not true at all	Rarely true	Sometimes true	Often true	True nearly all the time
22. I feel in control of my life.	0	1	2	3	4
23. I like challenges.	0	1	2	3	4
24. I work to attain my goals, no matter what roadblocks I encounter along my way.	0	1	2	3	4
25. I take pride in my achievements.	0	1	2	3	4

Trauma Symptom Inventory

0 1 2 3

Never Often

In the past 6 months, how often have you experienced:

1. Nightmares or bad dreams	0	1	2	3
2. Trying to forget about a bad time in your life	0	1	2	3
3. Irritability	0	1	2	3
4. Stopping yourself from thinking about the past	0	1	2	3
5. Getting angry about something that wasn't very important	0	1	2	3
6. Feeling empty inside	0	1	2	3
7. Sadness	0	1	2	3
8. Flashbacks (sudden memories or images of upsetting things)	0	1	2	3
9. Not being satisfied with your sex life	0	1	2	3
10. Feeling like you were outside of your body	0	1	2	3
11. Lower back pain	0	1	2	3
12. Sudden disturbing memories when you were not expecting them	0	1	2	3
13. Wanting to cry	0	1	2	3
14. Not feeling happy	0	1	2	3
15. Becoming angry for little or no reason	0	1	2	3
16. Feeling like you don't know who you really are	0	1	2	3
17. Feeling depressed	0	1	2	3
18. Having sex with someone you hardly knew	0	1	2	3
19. Thoughts or fantasies about hurting someone	0	1	2	3
20. Your mind going blank	0	1	2	3
21. Fainting	0	1	2	3
22. Periods of trembling or shaking	0	1	2	3
23. Pushing painful memories out of your mind	0	1	2	3
24. Not understanding why you did something	0	1	2	3
25. Threatening or attempting suicide	0	1	2	3
26. Feeling like you were watching yourself from far away	0	1	2	3
27. Feeling tense or "on edge"	0	1	2	3

	0	1	2	3
	Never			Often
28. Getting into trouble because of sex	0	1	2	3
29. Not feeling like your real self	0	1	2	3
30. Wishing you were dead	0	1	2	3
31. Worrying about things	0	1	2	3
32. Not being sure of what you want in life	0	1	2	3
33. Bad thoughts or feelings during sex	0	1	2	3
34. Being easily annoyed by other people	0	1	2	3
35. Starting arguments or picking fights to get your anger out	0	1	2	3
36. Having sex or being sexual to keep from feeling lonely or sad	0	1	2	3
37. Getting angry when you didn't want to	0	1	2	3
38. Not being able to feel your emotions	0	1	2	3
39. Confusion about your sexual feelings	0	1	2	3
40. Using drugs other than marijuana	0	1	2	3
41. Feeling jumpy	0	1	2	3
42. Absent-mindedness	0	1	2	3
43. Feeling paralyzed for minutes at a time	0	1	2	3
44. Needing other people to tell you what to do	0	1	2	3
45. Yelling or telling people off when you felt you shouldn't have	0	1	2	3
46. Flirting or "coming on" to someone to get attention	0	1	2	3
47. Sexual thoughts or feelings when you thought you shouldn't have them.	0	1	2	3
48. Intentionally hurting yourself (for example, by scratching, cutting, or burning) even though you weren't trying to commit suicide.	0	1	2	3
49. Aches and pains	0	1	2	3
50. Sexual fantasies about being dominated or overpowered	0	1	2	3
51. High anxiety	0	1	2	3
52. Problems in your sexual relations with another person	0	1	2	3

	0	1	2	3
	Never			Often
53. Wishing you had more money	0	1	2	3
54. Nervousness	0	1	2	3
55. Getting confused about what you thought or believed	0	1	2	3
56. Feeling tired	0	1	2	3
57. Feeling mad or angry inside	0	1	2	3
58. Getting into trouble because of your drinking	0	1	2	3
59. Staying away from certain people or places because they reminded you of something	0	1	2	3
60. One side of your body going numb	0	1	2	3
61. Wishing you could stop thinking about sex	0	1	2	3
62. Suddenly remembering something upsetting about your past	0	1	2	3
63. Wanting to hit someone or something	0	1	2	3
64. Feeling hopeless	0	1	2	3
65. Hearing someone talk to you who wasn't really there	0	1	2	3
66. Suddenly being reminded of something bad	0	1	2	3
67. Trying to block out certain memories	0	1	2	3
68. Sexual problems	0	1	2	3
69. Using sex to feel powerful or important	0	1	2	3
70. Violent dreams	0	1	2	3
71. Acting "sexy" even though you didn't really want sex	0	1	2	3
72. Just for a moment, seeing or hearing something upsetting that happened earlier in your life	0	1	2	3
73. Using sex to get love or attention	0	1	2	3
74. Frightening or upsetting thoughts popping into your mind	0	1	2	3
75. Getting your own feelings mixed up with someone else's	0	1	2	3
76. Wanting to have sex with someone who you knew was bad for you	0	1	2	3
77. Feeling ashamed about your sexual feelings or behavior	0	1	2	3
78. Trying to keep from being alone	0	1	2	3

	0	1	2	3
	Never			Often
79. Losing your sense of taste	0	1	2	3
80. Your feelings or thoughts changing when you were with other people	0	1	2	3
81. Having sex that had to be kept a secret from other people	0	1	2	3
82. Worrying that someone is trying to steal your ideas	0	1	2	3
83. Not letting yourself feel bad about the past	0	1	2	3
84. Feeling like things weren't real	0	1	2	3
85. Feeling like you were in a dream	0	1	2	3
86. Not eating or sleeping for 2 or more days	0	1	2	3
87. Trying not to have any feelings about something that once hurt you	0	1	2	3
88. Daydreaming	0	1	2	3
89. Trying not to think or talk about things in your life that were painful	0	1	2	3
90. Feeling like life wasn't worth living	0	1	2	3
91. Being startled or frightened by sudden noises	0	1	2	3
92. Seeing people from the spirit world	0	1	2	3
93. Trouble controlling your temper	0	1	2	3
94. Being easily influenced by others	0	1	2	3
95. Wishing you didn't have any sexual feelings	0	1	2	3
96. Wanting to set fire to a public building	0	1	2	3
97. Feeling afraid you might die or be injured	0	1	2	3
98. Feeling so depressed that you avoided people	0	1	2	3
99. Thinking that someone was reading your mind	0	1	2	3
100. Feeling worthless	0	1	2	3

Appendix B. Institutional Review Board (IRB) Protocol Approval

UNIVERSITY OF ARKANSAS

Office of Research Compliance
Institutional Review Board

May 6, 2011

MEMORANDUM

TO:	Elizabeth Chaisson Patricia Petretic
FROM:	Ro Windwalker IRB Coordinator
RE:	New Protocol Approval
IRB Protocol #:	11-04-635
Protocol Title:	*Examining the Relations among Trauma, Distress, Resilience, and Physical Health*
Review Type:	☒ EXEMPT ☐ EXPEDITED ☐ FULL IRB
Approved Project Period:	Start Date: 05/06/2011 Expiration Date: 05/05/2012

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. This form is available from the IRB Coordinator or on the Compliance website (http://www.uark.edu/admin/rsspinfo/compliance/index.html). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

This protocol has been approved for 200 participants. If you wish to make *any* modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

If you have questions or need any assistance from the IRB, please contact me at 210 Administration Building, 5-2208, or irb@uark.edu.

210 Administration Building • 1 University of Arkansas • Fayetteville, AR 72701
Voice (479) 575-2208 • Fax (479) 575-3846 • Email irb@uark.edu

Appendix C. Demographic Statistics of a Female Community Sample (N = 206)

Ethnicity	N	Percentage
Caucasian	151	73.3%
African American	45	21.8%
Hispanic/Latino	4	1.9%
Asian/Asian American	3	1.4%
Other	2	1.0%

Marital Status	N	Percentage
Single/Never married	28	13.6%
Member of unmarried couple	11	5.3%
Married	149	72.3%
Widowed	2	1.0%
Separated	5	2.4%
Divorced	11	5.3%

Total Number of People Living in Home	N	Percentage
1	17	8.3%
2	76	36.9%
3	54	26.2%
4	30	14.6%
5	16	7.8%
6	5	2.4%

Total Number of People Living in Home	N	Percentage
7	2	1.0%
11	2	1.0%

Education	N	Percentage
Never attended school/Only Kindergarten	1	.5%
Elementary	2	1.0%
Some high school	2	1.0%
High school graduate	26	12.6%
Some college	54	26.2%
College graduate	60	29.1%
Postgraduate/Professional school	60	29.1%

Employment	N	Percentage
Employed full-time	139	67.5%
Employed part-time	19	9.2%
Out of work for more than a year	0	0
Out of work for less than a year	4	1.9%
Homemaker	16	7.8%
Student	7	3.4%
Retired	14	6.8%

Employment	N	Percentage
Unable to work	7	3.4%

Income	N	Percentage
Less than $35,000	55	26.7%
$35,000 - $75,000	73	35.4%
$75,000 or more	74	35.9%

Appendix D. Prevalence of Polyvictimization in a Female Community Sample (N = 206)

Table 1. Prevalence of Lifetime Traumatic Events in Those Reporting Childhood Sexual Abuse (n = 39)

Type of event	N	Percentage of Subset (n = 39)***	Percentage of Total Sample (N = 206)***
Physical abuse	11	28.2%	5.3%
Child sexual behavior (victim)	7	17.9%	3.4%
Psychological abuse	14	35.9%	6.8%
Emotional neglect	19	48.7%	9.2%
Physical neglect	7	17.9%	3.4%
Parental separation/divorce	20	51.3%	9.7%
Domestic violence	6	15.4%	2.9%
Familial substance abuse	14	35.9%	6.8%
Familial mental illness	11	28.2%	5.3%
Familial incarceration	4	10.3%	1.9%
Natural disaster (child)	3	7.7%	1.4%
Auto accident (child)	9	23.1%	4.4%
Witness death/serious injury (child)	6	15.4%	2.9%
Sexual assault	7	17.9%	3.4%
IPV – Assault	11	28.2%	5.3%
IPV – Severe homicidal assault	6	15.4%	2.9%

Type of event	N	Percentage of Subset (n = 39)***	Percentage of Total Sample (N = 206)***
Physical assault	6	15.4%	2.9%
Auto accident (adult)	9	23.1%	4.4%
Natural disaster (adult)	4	10.3%	1.9%
Witness death/serious injury	5	12.8%	2.4%

Note. Percentage amounts total over 100 due to participants being able to endorse more than 1 trauma occurrence over lifetime.

Table 2. Prevalence of Lifetime Traumatic Events in Those Reporting Adult Sexual Assault (n = 22)

Type of event	N	Percentage of Subset (n = 22)***	Percentage of Total Sample (N = 206)***
Sexual assault with penetration	18	81.8%	8.7%
Sexual assault by date/intimate partner	16	72.7%	7.8%
Childhood physical abuse	6	27.3%	2.9%
Childhood sexual abuse	7	31.8%	3.4%
Child sexual behavior (victim)	5	22.7%	2.4%
Psychological abuse	9	40.9%	4.4%
Emotional neglect	8	36.4%	3.9%
Physical neglect	3	13.6%	1.4%
Parental separation/divorce	10	45.5%	4.8%
Domestic violence	4	18.2%	1.9%
Familial substance abuse	10	45.5%	4.8%
Familial mental illness	9	40.9%	4.4%
Familial incarceration	1	4.5%	.5%
Natural disaster (child)	1	4.5%	.5%
Auto accident (child)	7	31.8%	3.4%

Type of event	N	Percentage of Subset (n = 22)***	Percentage of Total Sample (N = 206)***
Witness death/serious injury (child)	1	4.5%	.5%
IPV – Assault	10	45.5%	4.8%
IPV – Severe homicidal assault	4	18.2%	1.9%
Physical assault	6	27.3%	2.9%
Auto accident (adult)	6	27.3%	2.9%
Natural disaster (adult)	3	13.6%	1.4%
Police assault	1	4.5%	.5%
Witness death/serious injury	4	18.2%	1.9%

Note. Percentage amounts total over 100 due to participants being able to endorse more than 1 trauma occurrence over lifetime.

Table 3. Prevalence of Lifetime Traumatic Events in Those Reporting Intimate Partner Violence (n = 38)

Type of event	N	Percentage of Subset (n = 38)***	Percentage of Total Sample (N = 206)***
Childhood physical abuse	10	26.3%	4.8%
Childhood sexual abuse	12	31.6%	5.8%
Child sexual behavior (victim)	5	13.2%	2.4%
Psychological abuse	13	34.2%	6.3%
Emotional neglect	12	31.6%	5.8%
Physical neglect	3	7.9%	1.4%
Parental separation/divorce	16	42.1%	7.8%
Domestic violence	7	18.4%	3.4%
Familial substance abuse	10	26.3%	4.8%
Familial mental illness	9	23.7%	4.4%
Familial incarceration	5	13.2%	2.4%
Natural disaster (child)	2	5.3%	1.0%
Auto accident (child)	9	23.7%	4.4%
Witness death/serious injury (child)	3	7.9%	1.5%
Sexual assault	10	26.3%	4.8%
- by intimate	9	26.3%	4.4%

Type of event	N	Percentage of Subset (n = 38)***	Percentage of Total Sample (N = 206)***
partner			
IPV – Assault	37	97.4%	18.0%
IPV – Severe homicidal assault	13	34.2%	6.3%
Physical assault	5	13.2%	2.4%
Auto accident (adult)	12	31.6%	5.8%
Natural disaster (adult)	4	10.5%	1.9%
Police assault	1	2.6%	.5%
Witness death/serious injury	4	10.5%	1.9%

Note. Percentage amounts total over 100 due to participants being able to endorse more than 1 trauma occurrence over lifetime.

Appendix E. Factor Analysis of Outcome Measures for Creation of Composite Dependent Variables – Somatic Malaise and Health Behaviors/Utilization

Table 1. Reproduced Correlations Among Outcome Variables Included in Factor Analysis

	Health Status	PILL distress	Visits	Diagnoses	CPTavg
Health Status					
PILL distress	.530**				
Visits	.139*	.083			
Diagnoses	.128	.065	.801**		
CPTavg	.093	.007	.503**	.523**	
MedHistory	.187*	.232**	.053	-.019	-.042

Note. *values significant at $p < .05$; **values significant a $p < .01$

Table 2. Pattern Matrix

	Factor 1	Factor 2
Health Status	.076	.646
PILLdistress	-.014	.813
Visits	.873	.036
Diagnoses	.914	.004
CPTavg	.577	-.025
MedHistory	-.026	.291

Table 3. Structure Matrix

	Factor 1	Factor 2
Health Status	.138	.653
PILLdistress	.064	.811
Visits	.876	.120
Diagnoses	.914	.091
CPTavg	.574	.030
MedHistory	.002	.289

Table 4. Communalities

	Initial	Extraction
Health Status	.297	.432
PILLdistress	.301	.432
Visits	.657	.769
Diagnoses	.664	.835
CPTavg	.299	.331
MedHistory	.074	.084

Appendix F. TSI Scale Descriptive Data

Table 1. TSI Clinical Scales: Mean Scores, Standard Deviations, and Ranges

Scale	M	SD	Minimum	Maximum
Anxious Avoidance (AA)	46.15	8.93	35.0	74.0
Depression (D)	46.66	7.97	38.0	78.0
Anger/Irritability (A/I)	48.99	9.61	37.0	78.0
Intrusive Experiences (IE)	47.95	8.88	39.0	82.0
Defensive Avoidance (DA)	48.08	9.36	38.0	77.0
Dissociation (DIS)	47.74	8.22	39.0	93.0
Sexual Concerns (SC)	47.27	7.81	42.0	86.0
Dysfunctional Sexual Behaviors (DSB)	46.92	6.80	44.0	87.0
Impaired Self Reference (ISR)	45.80	7.71	39.0	74.0
Tension Reducing Behaviors (TRB)	47.49	8.37	42.0	99.0

Table 2. Pearson Correlation Values Among TSI Clinical Scales

	AA	D	AI	IE	DA	DIS	SC	DSB	ISR
AA									
D	.696								
AI	.657	.670							
IE	.575	.646	.508						
DA	.587	.653	.531	.828					
DIS	.698	.705	.580	.610	.610				
SC	.449	.503	.483	.466	.553	.490			
DSB	.378	.512	.461	.470	.469	.488	.641		
ISR	.740	.788	.651	.683	.687	.745	.560	.536	
TRB	.539	.655	.744	.539	.530	.637	.568	.815	.659

Note. all values significant at $p < .01$