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The Role of Anxiety Sensitivity in the Relationship between Posttraumatic Stress Symptoms and Negative Outcomes in Trauma-Exposed Adults

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The Role of Anxiety Sensitivity in the Relationship between Posttraumatic Stress Symptoms and
Negative Outcomes in Trauma-Exposed Adults

by

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A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
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Abstract

Background: The development of posttraumatic stress symptoms (PTS) following a traumatic event is related to significant functional impairment, diminished quality of life, and physical health issues. Yet it is not entirely clear why some traumatized individuals experience negative outcomes while others do not. The purpose of this study is to determine the role of several influential factors related to PTS severity and negative outcomes, such as diminished quality of life and physical health issues, following traumatic events. **Method:** One hundred and twenty-two trauma-exposed adults were recruited through the University of South Florida's SONA system and through flyers on campus. Subjects were administered the following self-report measures in a counter-balanced manner: the PTSD Checklist-Civilian, the Trauma History Questionnaire-Short, The Anxiety Sensitivity Index-3, Depression and Anxiety Stress Scale 21, Sheehan Disability Scale, WHOQOL-BREF, and the Economic Impact Questionnaire-Revised. **Results:** Posttraumatic stress symptom severity was positively correlated with depressive symptom severity, chronicity of the most distressing trauma and number of traumas. Posttraumatic stress symptom severity and anxiety sensitivity were significantly related to all of the outcomes examined including three domains of disability, four domains of quality of life, burden and physical health issues. Main effects were found for PTS severity, anxiety sensitivity, and depressive symptom severity on quality of life domains. Posttraumatic stress symptom severity mediated the relationship between anxiety sensitivity and physical health issues such that the relationship between AS and physical health issues is dependent on PTS severity.

Implications: This study helps clarify the role of various factors in the relationship between trauma and negative outcomes. Clinical and research implications are discussed, including early detection of PTS and an increased awareness of the relationship between PTS, anxiety sensitivity and physical health issues.

Introduction

Lifetime exposure to a traumatic event that is met with extreme horror, fear or helplessness is a common occurrence among adults (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995) with rates in the United States of America ranging from less than 2% (i.e., being held captive, kidnapped, tortured) to as high as 60% (i.e., sudden unexpected death of a loved one) (Breslau et al., 1998). Between 9-50% of trauma-exposed adults go on to exhibit clinical levels of PTS (Breslau et al., 1998) including re-experiencing of the trauma (e.g., flashbacks, intrusive recollections), avoidance of traumatic reminders and hyperarousal (e.g., irritability, insomnia, hypervigilance). The development of PTS is highly related to psychosocial and occupational impairment (Malta, Levitt, Martin, Davis, & Cloitre, 2009), diminished quality of life (Nygaard & Heir, 2012; Schnurr & Lunney, 2011; Teodorescu et al., 2012) and physical health issues (Hensley & Varela, 2008; Qureshi, Pyne, Magruder, Schulz, & Kunik, 2009).

Several theoretical models are available that attempt to explain the development of PTS and posttraumatic stress disorder (PTSD) in traumatized adults. Biological theories have posited that the continuous release of stress-related hormones, genetic predispositions (Yehuda et al., 2010) and changes in neuroanatomy may lead to the development of PTSD (Zhang, Zhou, Li, Ursano, & Li, 2006). Psychosocial theories regarding the development of PTSD posit that exposure to childhood adversity and trauma (Brewin, Andrews, & Valentine, 2000), resource loss (e.g., losing your home; losing your sense of safety) (Littleton, Kumpula, & Orcutt, 2011), and the accumulation of stressful events pre-trauma may predispose individuals to the development of PTSD (Schnurr, Lunney, & Sengupta, 2004). Cognitive theories highlight the

role of information processing and cognitive distortions regarding the trauma in the development of PTSD (Weber, 2008). Learning theory focuses on the continuation of fear reactions post-trauma to non-threatening stimuli that have been misinterpreted as dangerous or fearful (Silove, 1998). Within all of these theories, there is evidence pointing to a direct contribution to behavioral avoidance as individuals tend to avoid thoughts, places, conversations and people that trigger trauma reminders. Unfortunately, it is unclear at this time which theory most accurately explains the development of PTSD; it is likely that a combination of many factors underpins this complicated disorder (Rosen, Frueh, Elhai, Brubaug, & Ford, 2010).

The goal of this study is to determine the role of several influential factors related to PTS severity and adverse outcomes, such as diminished quality of life and physical health issues, following traumatic events. First several factors that influence PTS severity in traumatized adults will be discussed. These factors include gender, depressive symptom severity, age at the time of the most distressing traumatic event, number of different traumas, time elapsed since the most distressing trauma and chronicity of the most distressing trauma (frequency of the same trauma reoccurring). Next, past research investigating the relationship between PTS and negative outcomes including impairment and burden, diminished quality of life, and physical health issues will be highlighted. The role of anxiety sensitivity (AS) in the association between PTS and these negative outcomes will be discussed, with a focus on the relationship between PTS and AS. Lastly, the aims for the present study will be detailed with predictions regarding the directions of findings.

Variables Related to the Severity of Posttraumatic Stress Symptoms

It is not entirely clear why some trauma-exposed adults go on to exhibit clinically significant levels of PTS and subsequent impairment, while others tend to have mild or no PTS. Knowing that an individual has experienced a traumatic event is not sufficient in predicting the course of their PTS. Rather, understanding the various contributing risk factors, including both pre-trauma (e.g., gender) and trauma-related (e.g. chronicity of trauma) variables, will help elucidate why there is so much variation in PTS severity across trauma-exposed adults. Determining what factors influence the severity of PTS will aid in both the assessment of and early intervention for PTS. Several demographic and clinical factors have been indicated as associated with the development of more severe PTS following trauma exposure. A description of these variables and how they relate to the severity of PTS follows¹.

Gender. Gender may be associated with PTS severity. Findings are mixed with some studies indicating that females exhibit higher rates of PTS severity (North, Oliver, & Pandya, 2012; Skopp et al., 2011) while others indicate the opposite (Iverson et al., 2011; Maguen, Ren, Bosch, Marmar, & Seal, 2010). A meta-analysis addressing the role of gender as a risk factor for PTS severity found no differences between males and females for military samples but a significant difference, with females exhibiting more severe PTS, in a civilian sample (Brewin et al., 2000). In addition to empirical findings indicating that civilian women exhibit more severe PTS as compared to males, epidemiological and meta-analytic studies of PTSD indicate that PTSD is more prevalent in females as compared to males (Breslau et al., 1998; Tolin & Foa, 2006). In order to fully understand why women tend to exhibit more severe PTS, it is important to consider other factors related to gender that may influence these findings. For instance, symptom reporting may differ among genders with females being more willing to report

¹ The majority of the information presented here is based on studies conducted in the United States of America.

distressing symptoms (Brewin et al., 2000). Similarly, females may be more likely to have experienced prior traumas such as childhood sexual abuse, which is associated with high rates of PTS (Tolin & Foa, 2006; Wolfe & Kimerling, 1997). Despite some support to the contrary in military samples, it is evident through both meta-analytic studies as well as epidemiological studies that being female is generally associated with the development of more severe PTS following traumatic events (Breslau et al., 1998; Brewin et al., 2000; North et al., 2012; Tolin & Foa, 2006).

Depression Symptom Severity. Depressive symptom severity may be positively correlated with PTS severity (Hirth & Berenson, 2012a; Kroll et al., 1989). There are several hypotheses regarding the connection between PTS and depressive symptom severity. Pre-trauma depressive symptoms may increase an individuals' vulnerability to the development of PTS following a traumatic event as individuals may not have the coping skills or resources available to deal with the aftermath of the trauma-exposure (Breslau, Davis, Peterson, & Schultz, 1997). Reciprocally, the presence of PTS increases vulnerability for the onset of depressive symptoms (Breslau et al., 1997; Kessler, Berglund, Demler, Jin, & Walters, 2005). It is also important to consider that exposure to a traumatic event, as well as a history of prior trauma exposure may increase an individual's risk of developing both depressive and posttraumatic stress symptoms, thereby indicating a shared vulnerability for both symptom clusters (O'Donnell, Creamer, & Pattison, 2004). When PTSD and major depressive disorder co-occur, individuals exhibit more severe symptoms as compared to when the disorders occur alone (Kessler, Chiu, Demler, Merikangas, & Walters, 2005; Post, Zoellner, Youngstrom, & Feeny, 2011). Although commonly co-occurring after a traumatic event, evidence suggests that PTSD and major

depressive disorder are separate constructs that independently influence the severity of post-trauma symptomology (Post et al., 2011).

Age at Trauma-Exposure. Age at the time of trauma is negatively correlated with current PTS severity, indicating that exposure to trauma at an earlier age is associated with more severe PTS. Specifically, exposure to physical abuse, sexual abuse or neglect at or before age eleven is more highly associated with the development of PTS than exposure to such events at or after age twelve (McCutcheon et al., 2010). In young adult women, early exposure to sexual assault or abuse is the strongest predictor of PTS severity (McCutcheon et al., 2010). In a meta-analysis examining multiple risk factors for the development of PTSD, exposure to a traumatic event at a younger age was significantly related to PTSD across all types of sample and study characteristics. Specifically, exposure at a young age was associated with PTSD in male and female populations, retrospective and prospective studies, analysis by PTSD diagnosis or PTS continuous score, and self-reported or clinician-measured PTSD (Brewin et al., 2000). It is important to take into account the fact that the risk of experiencing many types of traumas (e.g., assaultive violence) declines significantly as age increases (Breslau et al., 1998). Additionally, there are several other reasons why exposure at a young age may influence PTS severity. Exposure to trauma at a young age has deleterious effects on biological, social and emotional facets of development. Trauma that occurs in childhood may disrupt the integration of neural systems and interfere with the functioning of the neuroendocrine system (Moroz, 2005). Though these effects are possible throughout the lifespan, biological changes in youth can be associated with changes in the structure of the brain and the integration of central nervous system functioning. Socially and emotionally, exposure to trauma at an early age may be associated with

an inability to regulate affect, a lack of trust in others, a foreshortened sense of future and a necessary focus on survival rather than self-actualization (Moroz, 2005).

Number of Traumas. Number of traumas indicates the frequency of an individual's exposure to different trauma types. For example, an individual who was physically abused as a child and then was sexually assaulted as an adult would have experienced two traumas, despite the chronicity of the childhood physical abuse. Not surprisingly, number of traumas experienced is positively correlated with PTS severity (Deering, Glover, Ready, Eddleman, & Alarcon, 1996; McCutcheon et al., 2010). It is hypothesized that multiple traumas have a cumulative effect and therefore are associated with increased symptom burden (Deering et al., 1996). In a study of individuals with severe psychopathological disorders, number of different lifetime traumas was the strongest predictor of PTSD followed by childhood sexual abuse (Mueser et al., 1998). This effect has also been observed in youth who have experienced multiple traumas, with children who experienced a higher number of traumas exhibiting more severe symptoms of PTS (Mullett-Hume, Anshel, Guevara, & Cloitre, 2008).

Time Since Trauma. Findings regarding time since trauma and its relationship with PTS severity are varied, with research indicating a negative correlation between elapsed time and severity ($r = -0.60$) (Applebaum & Burns, 1991), while others indicate a positive correlation ($r = 0.39$) (Amir, Kaplan, & Kotler, 1996). Theoretically, a negative correlation is believed most plausible given that as time elapses individuals will have had more time to cope with the symptoms that developed in the aftermath of trauma. Additionally, the presence of intrusive thoughts are more likely to be triggered in the time period directly following the trauma as individuals' environments may not have changed and reminders of the traumatic event may be largely present.

Trauma Chronicity. Trauma chronicity is a variable that addresses the repetition and length of time of a trauma exposure. For example, witnessing the sudden death of a loved one is a single traumatic event, whereas being sexually abused weekly as a child for three years would be a more chronic, long-term traumatic event. More chronic traumas are associated with increased PTS severity across the majority of studies that address this relationship (Elliott, 1997; Goldsmith, Barlow, & Freyd, 2004). There is some overlap between trauma chronicity and number of traumas in that enduring repeated exposures may have a cumulative effect and therefore be associated with increased symptom burden. However, it is important to note that trauma chronicity differs from number of traumas in that trauma chronicity represents the repetition of a single trauma type (e.g., childhood physical abuse), whereas number of traumas indicates the frequency of various trauma types (e.g., childhood physical abuse and adulthood sexual assault).

Summary of Variables Influencing PTS Severity. As is evident, there are a number of variables that may be associated with PTS severity (Figure 1). Interestingly, research is mixed on the direction of these associations for many of the outlined variables. In addition to the complex relationship between trauma and PTS severity, another relationship exists between PTS severity and negative outcomes such as impairment, burden (e.g., missed work days), diminished quality of life, and physical health issues. Minimal research is available in highlighting the underlying mechanisms in the association between PTS and negative outcome variables. Though it seems obvious that those with increased PTS severity would have increases in adverse outcome variables, it is unclear what variables influence this relationship. Understanding the role of these influential variables would allow for more carefully tailored interventions aimed at the reduction

of PTS and the improvement of impairment, quality of life and physical health issues. Next is a discussion of the extant research on PTS and negative outcome variables.

Posttraumatic Stress and Negative Outcome Variables

Impairment and Burden. Posttraumatic stress symptoms cause individuals significant distress and, depending on the severity of symptoms, may affect aspects of daily living.

Posttraumatic stress disorder has been shown to be equally as or more impairing than other serious mental health problems such as schizophrenia (Kessler, 2000) resulting in diminished academic/professional, social and family functioning (Malta et al., 2009). Specifically, PTSD is associated with high rates of unemployment, divorce/marital trouble, inability to complete academic programs and significant increases in missed work days (Kessler, 2000). In addition to severe impairment across domains, risk of suicide in persons with PTSD is elevated (Kessler, 2000). For the purposes of this study, impairment was defined as PTS-related disability across the three domains of work, social life, and family life.

The burden of PTS is quite large, likely due to the high rates of impairment in individuals with these symptoms. Specifically, PTSD contributes to 3.6 missed work days per month which is representative of a 3 billion dollar cost in the United States of America. Additionally, PTSD accounted for approximately 0.6% of years lost to disability during 2001 which surpassed years lost to disability for schizophrenia (Ayuso-Mateos, 2001). Additionally, both mental-health and physical-health care service utilization is significantly elevated in persons with PTSD as compared to individuals exposed to trauma with no PTSD (Frayne et al., 2011). Specifically, PTS is highly associated with an increase in visits to specialists, general practitioners and mental health professionals as well as an increase in the frequency of emergency room visits and

hospitalizations (Fogarty, Sharma, Chetty, & Culpepper, 2008; Glaesmer, Braehler, Riedel-Heller, Freyberger, & Kuwert, 2011).

Quality of Life. The construct of quality of life is defined by two primary ideas which include an individual's functional status and an individual's perception of how their health impacts their life (Rapaport, Clary, Fayyad, & Endicott, 2005). Measures of quality of life typically depend on self-report and therefore indicate an individual's self-perceived level of diminishment across domains of quality of life. When investigating quality of life it is important to consider the various areas of one's life that may be affected by psychopathological conditions. For the purposes of this study, quality of life was defined as having four domains including physical health, psychological health, social relationships, and environment (Skevington, Lotfy, & O'Connell, 2004).

Given the high rates of disability and impairment associated with PTS symptoms, it is not surprising that quality of life will be negatively affected by the presence of PTS. It is estimated that approximately 59% of individuals with PTSD have significantly impaired quality of life. Quality of life impairments affect more people with PTSD than persons with panic disorder, obsessive-compulsive disorder and social phobia (Rapaport et al., 2005). Additionally, persons with PTSD have diminished quality of life across physical, social and emotional domains (Schonfeld et al., 1997; Zatzick, Marmar, et al., 1997; Zatzick, Weiss, et al., 1997). Though the majority of studies have looked at diagnosed PTSD rather than PTS as a continuous variable, there is evidence for a negative correlation between PTS severity and global quality of life (Nygaard & Heir, 2012). Interestingly, the relationship between trauma exposure and global quality of life is mediated by PTS and negative world assumptions (e.g., the world is unjust). (Nygaard & Heir, 2012).

Physical Health. The extant literature addressing PTS and physical health comorbidities shows a strong association between PTS and physiological disorders. Specifically, PTS has been linked to both subjective and objective physical health diagnoses including chronic pain, arthritis, asthma, epilepsy, heart attack/heart disease, diabetes, hypertension, stroke, and gastrointestinal disorders (Qureshi et al., 2009). Individuals with PTSD tend to have higher rates of medical diagnoses compared to trauma-exposed individuals with no PTSD diagnosis (Odds Ratios = 0.93-4.09 for women, 0.92-3.10 for men). Notably, the median number of medical diagnoses among trauma-exposed adults ranges from four to seven medical diagnoses (Frayne et al., 2011).

Similar to the extant literature on PTSD and QoL (Mendlowicz & Stein, 2000; Rapaport et al., 2005; Zatzick, Marmar, et al., 1997; Zatzick, Weiss, et al., 1997), the majority of studies addressing PTS and physical health have utilized a categorical diagnosis of PTSD rather than a continuous variable of PTS severity. However, several studies have indicated that even subsyndromal PTSD is significantly related to physical health symptoms and medical diagnoses (Fetzner, McMillan, & Asmundson, 2012; Pietrzak, Goldstein, Southwick, & Grant, 2012). Interestingly, there is evidence that the hyperarousal symptoms (e.g., irritability, insomnia, hypervigilance) following a traumatic event mediate the relationship between trauma and physical health symptoms (Boals, Riggs, & Kraha, 2012).

For the purposes of this study, physical health symptoms were measured by several questions relating to health status. First, self-report of the presence of medical diagnoses, such as diabetes, hypertension and asthma was assessed. Second, self-report of somatic symptoms, such as headaches and stomachaches was assessed. Last, the combination of medical diagnoses and

somatic symptoms was measured. Additionally, this study will examine the use of health care services for both mental and physical health symptoms/diagnoses.

Summary of the Association between PTS and Negative Outcome Variables. Though it is quite clear that a strong association exists between PTS and negative outcome variables including impairment, burden, diminished quality of life and physical health issues, it is unclear at this time what drives this connection. Why do some individuals with PTSD have significant impairments across domains of functioning, diminished quality of life and physical health issues, while others are significantly less affected by negative outcomes? It is possible that a trait-related variable, such as anxiety sensitivity (AS), influences this relationship in such a way that the rates of impairment in individuals with PTS is dependent on the level of AS. What follows is a discussion of the association between PTS and AS.

Anxiety Sensitivity and Posttraumatic Stress Symptoms

Anxiety sensitivity has been defined as a trait-based fear of arousal- or anxiety-related sensations which are misinterpreted as physically, socially or cognitively harmful or dangerous (Taylor, 1995). Anxiety sensitivity is considered a cognitive vulnerability that contributes to a cyclical elevation of anxiety symptoms. Persons with AS find the experience of anxiety-related sensations to be intolerable or aversive, as they interpret these stimuli as a threat to their well-being (Olatunji & Wolitzky-Taylor, 2009). For example, a person may experience benign heart palpitations as a result of anxiety, which are misinterpreted as an ominous cardiovascular event. During this misinterpretation, the person experiences a sense of fear relating to the stimuli and thereby develops an increase in anxiety. The anxiety may then perpetuate the heart palpitations which may then yield a further increase in anxiety (Taylor, 1995). Another person with high AS may experience sweating as a result of anxiety. They may then make a fearful interpretation of

the arousal as a threat to their social well-being (e.g., “people can see that I am sweating and they will think I am crazy or disgusting”). Similar to the heart palpitations example, this fearful appraisal of the sweating may then lead to increased sweating and ultimately increased anxiety.

Anxiety sensitivity is usually described as a three factor construct that includes physical, social and cognitive concerns. This structural view of AS was derived from psychometric studies looking at the Anxiety Sensitivity Index (ASI), the first and most thoroughly researched measure of AS (Reiss, Peterson, Gursky, & McNally, 1986; Vujanovic, Arrindell, Bernstein, Norton, & Zvolensky, 2007). Although originally believed to be a one-factor concept, factor analyses of the ASI have confirmed the three-factor structure of AS (Taylor & Cox, 1998). Critiques regarding this factor structure are plentiful given that the measure was originally designed with a unitary structure in mind (Olatunji & Wolitzky-Taylor, 2009). Consequentially, AS is contemporarily viewed as having a higher order factor (trait-AS) with three lower order factors (physical, social and cognitive dimensions) (Rodriguez, Bruce, Pagano, Spencer, & Keller, 2004).

Anxiety sensitivity as a significant cognitive risk factor for the development and maintenance of PTS (Fedoroff, Taylor, Asmundson, & Koch, 2000) is an important aspect of the diathesis-stress model of PTS. The diathesis-stress model posits that the combination of preexisting vulnerabilities and exposure to a traumatic event(s) contributes to the development of PTS (Elwood, Mott, Williams, Lohr, & Schroeder, 2009; McKeever & Huff, 2003). This model has gained considerable attention as it helps elucidate why certain persons who experience a trauma develop more severe PTS while others do not (McKeever & Huff, 2003). Although many factors may be involved in the development of PTS, there is a large and consistent association between AS and PTS (Fetzner, Collimore, Carleton, & Asmundson, 2012; Lang, Kennedy, & Stein, 2002; Naragon-Gainey, 2010; Olatunji & Wolitzky-Taylor, 2009). The role of AS as a

preexisting trait-related cognitive vulnerability to PTSD has been the focus of several recent studies addressing the etiology of PTSD in traumatized persons (Elwood, Mott, et al., 2009; Lang et al., 2002; Marshall, Miles, & Stewart, 2010). Evidence for this model stems from research related to AS and panic disorder, as panic attacks are often precipitated by an activating event and are exacerbated by the preexisting vulnerability of heightened AS (Elwood, Mott, et al., 2009). Anxiety sensitivity causes individuals with PTSD to view their symptoms as dangerous, thereby increasing their anxiety and symptomatic psychopathology (Elwood, Hahn, Olatunji, & Williams, 2009; Fedoroff et al., 2000).

Marshall et al. (2010) illustrate two pathways in which AS may contribute to the development, exacerbation and/or maintenance of PTSD in vulnerable individuals. First, persons with high levels of AS may have more adverse reactions to traumatic events as compared to those with lower levels of preexisting AS. Within this framework, Marshall et al., (2010) posit that persons with high levels of AS pre-trauma may interpret both the traumatic event as well as their adverse reactions to the event as highly distressing. Second, traumas may lead to the development or heightening of AS as individuals become conditioned to previously innocuous stimuli as newly threatening (Marshall et al., 2010). Several important findings regarding the relationship between AS and PTSD were determined in Marshall et al.'s, (2010) prospective study of traumatized adults. Consistent with other studies, AS predisposes individuals to the development of PTSD (Asmundson & Stapleton, 2008; Lang et al., 2002; Marshall et al., 2010; Vujanovic, Zvolensky, & Bernstein, 2008) and individuals with high levels of AS are less likely to exhibit decreases in their PTSD symptomology over time as compared to those persons with lower baseline levels of AS (Marshall et al., 2010). Importantly, a reciprocal relationship between AS and PTSD was determined highlighting the reverse; PTSD symptoms also exert a

direct effect on AS. The cyclical nature of AS and psychopathology is apparent, with increased PTS leading to increased AS which thereby intensifies PTS (Marshall et al., 2010).

With significant evidence pointing to the relationship between AS and PTS, it is important to consider the role of AS in impairment, quality of life and physical health in individuals with PTS. One study to date has addressed the role of AS in the relationship between PTS and quality of life (Zvielli, Bernstein, & Berenz, 2012). Specifically, Zvielli et al. (2012) found that individuals with high AS demonstrated higher levels of PTS severity and more diminished quality of life as compared with individuals with low AS. Additionally, Zvielli et al. (2012) determined that persons with elevated levels of PTS had high rates on both the physical and psychological concerns AS scales.

Present Study

The present study examined several influential variables related to PTS severity following trauma and aimed to determine the role of AS in the relationship between PTS and various negative outcomes. First, this study examined several factors associated with PTS severity including gender, depressive symptom severity, age at the time of trauma, number of traumas, time elapsed since the trauma and chronicity of the trauma. It was predicted that females would have significantly more severe PTS as compared to males. Additionally, based on the available literature investigating these variables and their relationships with PTS severity, the following correlations were predicted: there would be a positive correlation between depressive symptom severity and PTS severity (Hirth & Berenson, 2012a), there would be a negative correlation between age at the time of trauma and PTS severity (McCutcheon et al., 2010), there would be a positive correlation between number of traumas and PTS severity (Deering et al., 1996), there would be a negative correlation between time elapsed since the trauma and PTS

severity (Turton, Hughes, Evans, & Fainman, 2001), and there would be a positive correlation between chronicity of the trauma and PTS severity (Goldsmith et al., 2004).

Second, this study examined the moderating role of AS as well as depressive symptom severity in the relationship between PTS severity and negative outcomes including quality of life and physical health issues. It was predicted that the relationship between PTS severity and both of the negative outcome variables would vary as a function of the level of AS, such that heightened AS would be associated with more diminished QoL (Zvielli et al., 2012) and more physical health issues. Though there is a paucity of research investigating the role of AS in this relationship, the strength of the association between AS and PTS provided preliminary evidence as to the possible moderating role of AS in the relationship between PTS and negative outcomes. Additionally, it was predicted that the relationship between PTS severity and both of the negative outcome variables would vary as a function of depressive symptom severity, such that more severe depression symptoms would be associated with more diminished quality of life and more physical health issues.

Third, this study investigated the mediating role of AS in the relationship between PTS and physical health issues (Figure 2) as well as the mediating role of PTS in the relationship between AS and physical health issues (Figure 3). It was hypothesized that both routes of mediation would be significant, adding further evidence to the reciprocally related variables of PTS and AS. Specifically, it was believed that PTS would influence an increase in AS which would influence an increase in physical health issues. At the same time, AS would influence an increase in PTS which would influence an increase in physical health issues. This aim was the first to explore the mediating role of these variables in the relationships between PTS and physical health issues as well as between AS and physical health issues. Both mediational

analyses were important due to the reciprocal nature of PTS and AS. Specifically, PTS severity is associated with increases in AS post-trauma while heightened AS post-trauma is also associated with increased PTS severity (Marshall et al., 2010).

Last, this study described the economic costs related to trauma and PTS. Specifically, this study highlighted the rate of work/school impairment, the rate of health care and mental health care utilization and the subjective perception of associated stigma related to the use of mental health services among traumatized adults.

Past research investigating the relationship between posttraumatic stress and negative outcomes, such as impairment, is limited. There is little to no exploration of the factors involved in this relationship and it remains unclear why some individuals with PTS exhibit high rates of impairment, diminished quality of life, and increased physical health issues while others do not. The role of AS as a factor involved in the relationship between PTS and negative outcomes has yet to be investigated empirically. However, the relationship between AS and PTS has been well established with evidence pointing to a reciprocal relationship between the two variables, wherein severity of AS predicts severity of PTS and severity of PTS predicts severity of AS (Marshall et al., 2010). The mediating role of AS in the relationship between PTS and physical health issues has yet to be investigated. Likewise, the mediating role of PTS in the relationship between AS and physical health issues has yet to be investigated. Understanding the mediating pathway underlying the relationship between these variables will help elucidate the mechanism driving the connection between PTS and physical health issues.

Method

Participants

One hundred and twenty two adults between the ages of 18 and 65 ($M = 23.84$, $SD = 6.84$) participated in the study. The sample consisted of 68.9% females ($N = 84$) and 31.1% males ($N = 38$), with a racial breakdown of 62.3% Caucasian, 9.0% African American, 13.1% Asian, 13.9% Biracial and 1.6% Native Hawaiian/Pacific Islander and an ethnic breakdown of 78.8% not Hispanic and 21.2% Hispanic. Recruitment took place through fliers hung on campus as well as through the SONA program in which students receive credit in their psychology courses for participating in research studies. Inclusion criteria included adults ages 18-65 years who were exposed to a trauma and were fluent in English. The full range of PTS severity was addressed by including adults with any range of PTS (including those with a trauma history but no PTS) to participate in the study. Verbal consent was received from all participants who agreed to take part in the study (Appendix H).

Measures

PTSD Checklist-Civilian; PCL-C (Appendix A) (Weathers, Litz, Herman, Huska, & Keane, 1993): The PCL-C is a 17-item self-report checklist of the 17 DSM-IV symptoms of PTSD. Respondents indicate the severity of each listed symptom on a 5-point likert scale (1 = not at all; 5 = extremely). The civilian variation of this measure asks respondents about stressful life events, thereby allowing for the assessment of symptoms related to multiple traumas. The

PCL-C can be used to obtain a total severity score or to evaluate whether DSM-IV criteria for a PTSD diagnosis are met. In the current sample the alpha was 0.90. The PCL has demonstrated strong internal consistency as well as moderate specificity and sensitivity when compared with the Clinician Administered PTSD Scale (CAPS) (Blanchard, Jones-Alexander, Buckley, & Forneris, 1996).

Trauma History Questionnaire-Short; THQ-S (Appendix B)(Green, 1996): This 18-item self-report questionnaire asks about crime-related experiences, general disaster and trauma experiences, and physical and sexual experiences. For each event, individuals are asked to indicate yes or no for whether the event ever happened, and if yes, to indicate the number of times and their approximate age when the event happened. For the purposes of this study, an additional question has been added to the THQ that inquires which traumatic event (if more than one was endorsed) the participant felt was most distressing. The THQ has strong psychometric properties including high construct validity and reliability (Hooper, Stockton, Krupnick, & Green, 2011).

Anxiety Sensitivity Index-3; ASI-3 (Appendix C) (Taylor et al., 2007) – This 18-item measure is the most psychometrically sound measure of AS available to date (Taylor et al., 2007). The ASI-3 inquires about fear related to the experience of anxiety symptoms and evaluates three dimensions of AS including physical concerns, social concerns and cognitive concerns. Responses are provided using a 5-point Likert scale where 0 = very little and 4 = very much. Higher total scores and domain scores indicate higher levels of anxiety sensitivity. In the current sample the alpha was 0.92. The ASI-3 has demonstrated strong psychometric properties including high factorial validity (Wheaton, Deacon, McGrath, Berman, & Abramowitz, 2012) as well as strong convergent, discriminant and criterion validity (Taylor et al., 2007).

Depression and Anxiety Stress Scale 21; DASS-21 (Appendix D) (Lovibond & Lovibond, 1995) - This 21-item self-report measure addresses depression, anxiety and stress, with 7 items per construct. Questions are asked in regards to symptoms present in the last week. Each item is evaluated on a four point Likert scale (0 = did not apply to me at all; 3 = applied to me very much or most of the time). Higher scores on the DASS-21 indicate higher levels of distress across the three negative states of depression, anxiety and stress. For the purposes of this study, the depression subscale score will be used to represent depressive symptom severity. In the current sample the alpha was 0.92. This short-form version of the DASS has good construct validity (Henry & Crawford, 2005) and internal consistency (Norton, 2007) as well as high sensitivity to identifying those with anxiety and depressive disorders (Mitchell, Burns, & Dorstyn, 2008).

Sheehan Disability Scale; SDS (Appendix E) (Sheehan, Harnett-Sheehan, & Raj, 1996)- This very brief scale allows the respondent to rate the degree of impairment their PTS causes in work/employment, social life, and family life/home responsibilities. Respondents utilize a 10-point visual analog scale to determine their level of impairment across the three domains. Three domain scores are generated as well as an optional overall impairment score ranging from 0 (unimpaired) to 30 (highly impaired). In the current sample the alpha was 0.82. The SDS demonstrates excellent internal consistency, acceptable test-retest reliability and good convergent and divergent validity (Arbuckle et al., 2009).

WHOQOL-BREF (Appendix F) (Skevington et al., 2004)- This 26-item self-report measure of quality of life addresses quality of life across the domains of physical health, psychological health, social relationships and environment. In addition, two questions address general quality of life. The WHOQOL-BREF produces four domain scores which indicate a

respondent's self-perception of their quality of life in that area. Higher scores indicate a superior quality of life. In the current sample the alpha was 0.90. The WHOQOL-BREF demonstrates good internal consistency and adequate convergent validity (Webster, Nicholas, Velacott, Cridland, & Fawcett, 2010).

Economic Impact Questionnaire-Revised; EIQ-R (Appendix G) - This self-report questionnaire addresses various demographics as well as various aspects of life that may be impacted by having posttraumatic stress symptoms. Specifically, this measure addresses interference in employment, physical/mental health, health care utilization for mental and physical health issues, as well as the stigma associated with mental health care utilization. Stigma was related to questions asking participants how likely they would seek mental health treatment, how comfortable they would be seeking mental health treatment and how embarrassed they would be should their friends find out about this treatment. This measure is a revised version of the Economic Impact Questionnaire (Tolin, Frost, Steketee, Gray, & Fitch, 2008) which was adapted from the National Comorbidity Study. Many of the questions were taken directly from the NCS interview which shows sound psychometric properties (Kessler et al., 1994). The measure was revised, with the permission of the authors, to reflect the burden of PTS rather than hoarding, which was the original construct addressed with this measure. For the purposes of this study, psychiatric work/school impairment was defined as the number of psychiatric work/school loss days (number of days in the past month that the individual was unable to work/go to school or carry out usual activities due to mental health issues) plus 50% of the number of psychiatric work/school cutback days (number of days in the past month that the individual was less effective at work/school or in activities due to mental health issues). This method of calculating psychiatric work/school impairment has been used in previous research

and is currently being used in studies from the NCS-replication data (Tolin et al., 2008). Somatic symptoms, adapted from the Patient Health Questionnaire (Spitzer, Kroenke, & Williams, 1999) were added to this measure. For physical health issues, three scores were generated: number of physical health conditions, number of somatic symptoms and number of combined physical health issues (physical health conditions score plus somatic symptoms score). The composite variable, termed “physical health issues”, was used as an outcome variable in the majority of the analyses.

Procedure

The study was comprised of several self-report measures. Students who were recruited through the flyers on campus or through the SONA system were asked if they would like to hear more about the study. If they agreed, they were consented by the principal investigator and administered the packet of measures electronically. The entire assessment took an average of approximately 30 minutes. Pilot testing was completed to establish time estimations for completion and to ensure both ease of use and the appropriateness of study measures. All measures were uploaded into an online surveying website for purposes of ensuring accurate data entry. Study measures were administered via the survey on a PC netbook.

Design Considerations

Recruitment. Several methodological issues were considered when determining the design of the present study. This study intended to explore PTS as a continuous variable in trauma exposed adults. Accordingly, to ensure the recruitment of participants that ranged from no/low PTS to those with severe PTS, a college campus was chosen as the recruitment site. The college campus allowed for recruitment of trauma exposed participants who ranged in PTS

severity from no symptoms to severe symptoms. Additionally, the college campus allowed for recruitment of non-treatment seeking and treatment seeking individuals alike.

There are currently 41,047 students attending the Tampa campus of the University of South Florida (23,402 females and 17,631 males). According to the Center for Disease Control, approximately 20% of college-attending women and approximately 4% of college-attending males have been sexually assaulted or raped in their lifetime (Douglas et al., 1997). Though this is only one type of trauma that was addressed in this study, at the University of South Florida Tampa campus alone, this equates to approximately 4,680 females and 705 males with a lifetime exposure to sexual assault or rape. In addition to these findings, research has shown that two-thirds of college students have been exposed to at least one trauma, with “having a life threatening illness” and “the sudden death of a loved one” endorsed the most frequently (Read, Ouimette, White, Colder, & Farrow, 2011). On the Tampa campus of the University of South Florida, this would equate to 27,365 traumatized adults.

Due to factors that may have influenced gender disparities among participants, recruitment focused on attaining at least 36 males and at least 36 females (see power analysis information below). Due to the difficulty faced in attaining adequate numbers of male participants, recruitment was capped for females at $N = 84$ and tailored to the recruitment of exclusively males.

Due to the time commitment of 30 minutes required to participate in this study, it was important to include a small incentive for participants. Those recruited through fliers on campus received \$10.00 for their participation in the study. Students recruited through SONA received one course credit unit for participation. These various recruitment methods ensured that enough traumatized adults were recruited. Recruiting only through SONA on campus would have limited

the college sample to psychology students. Inherent differences on demographic and clinical variables between psychology students and other students were avoided by recruiting through both SONA and flyers on campus.

Assessment of PTS. Careful consideration was given to whether a clinician-administered or self-report measure of PTS should be used for this study. It was determined that a self-report measure would be preferable to a clinician-administered measure. This determination was made based on the author's and committee members' clinical experience with traumatized adults. Specifically, there was concern that if a clinician-administered measure was used, symptoms of avoidance (a clinical hallmark of PTS) would prevent subjects from taking part in the study. If participants were aware that they would be interviewed about their trauma and trauma-related symptoms, they may be reluctant to participate. Additionally, if a clinician-administered measure was used, the study may attract those with little to no PTS symptoms only and miss a large subsection of persons with more severe PTS due to their heightened avoidance symptoms. There have been three empirical studies that have examined PTSD and AS, all of which utilized a self-report measure of PTS (Jakupcak et al., 2006; Marshall et al., 2010; Martin, Halket, Asmundson, Flora, & Katz, 2010).

Data Analysis

First, demographic and clinical characteristics of both PTS and AS were evaluated utilizing descriptive statistics. T-tests were used to determine gender differences in PTS severity. Pearson correlations were used to determine the relationship between PTS severity and depressive symptoms severity, age at the time of the most distressing trauma, number of traumas, time elapsed since the most distressing trauma and chronicity of the most distressing trauma. A Holm-Bonferroni correction was used for the predictors to control for multiple comparisons with

a corrected alpha of 0.01. Pearson correlations were also used to determine the relationship between PTS and negative outcomes as well as between AS and negative outcomes. For the purpose of these analyses, negative outcomes included the following variables: three domains of disability, four domains of quality of life, burden and physical health issues. Missing data was handled using the mean imputation method (Rubin, Witkiewitz, Andre, & Reilly, 2007).

Second, hierarchical regression was used to determine the moderating role of AS in the relationship between PTS and negative outcomes. For this analysis, negative outcomes were the dependent variables with PTS entered in step 1, AS in step 2 and PTS X AS in step 3. This analysis was completed with the following variables as dependent variables: quality of life (four domains) and physical health issues. Hierarchical regression was also used to determine the additive role of depressive symptom severity on the relationship between PTS and negative outcomes. For this analysis, PTS was entered in step 1, depressive symptom severity in step 2 and PTS X depressive symptom severity in step 3 and the dependent variables was quality of life and physical health issues.

Bootstrapping mediational analyses were used to determine the role of AS in the relationship between PTS and physical health issues. Posttraumatic stress symptoms was entered as the independent variable, AS as the mediating variable and physical health issues as the dependent variable. Additionally, a reciprocal relationship was investigated with PTS as the mediating variable, AS as the independent variable and physical health issues as the dependent variable. The provided sample was resampled $k = 5,000$ times generating a 95% confidence interval. The criterion for mediation was the exclusion of zero between the lower and upper bound of the confidence interval. If zero was not present it indicated that the indirect effect of the mediator on the outcome was not zero with 95% confidence (Hayes, 2009).

Last, descriptive statistics were provided to highlight the burden associated with PTS. A correlation between work/school impairment and PTS was determined. Rates of health care utilization for physical and mental health issues were highlighted. Additionally, the stigma related to mental health care utilization was determined using frequency data. Stigma was evaluated with questions concerning how likely a participant would go for mental health treatment, how comfortable they would be talking to a mental health practitioner and how embarrassed they would be should their friends find out about this treatment.

Power analyses were completed for the correlations, t-test (gender) and moderational analyses. The power analysis for the correlations revealed that a sample size of 64 would allow a medium effect size to be detected with a .80 power. The power analysis for the group differences between genders revealed that a sample size of 36 members per group (total sample size = 72) would allow a medium effect size to be detected with a .80 power. The power analysis for moderation revealed that a sample size of 81 participants would allow an interaction of $f^2 = 0.10$ to be detected with .80 power. Power for mediational analyses is not well described. In the current project bootstrapping procedures were utilized as they have the advantage of being more powerful than traditional approaches (Baron & Kenny, 1986).

Results

Sample Characteristics

Means and standard deviations for various study measures are presented in Table 1. Independent group *t*-tests indicated no significant differences between those who were recruited via flyers ($N = 72$) versus those who were recruited via the SONA psychology participant pool ($N = 50$) on any study variables including PTS severity, anxiety sensitivity total, total physical symptoms, or quality of life across the four domains (i.e., physical, psychological, social and environmental). Effect sizes for these non-significant values were in the small effect range (*ds*: -0.02 to 0.25). Similarly, independent group *t*-tests indicated no significant differences between trauma type (i.e., sexual or nonsexual) on any study variables including posttraumatic stress symptom severity, anxiety sensitivity total, total physical symptoms, or quality of life across the four domains (i.e., physical, psychological, social and environmental). Effect sizes for these non-significant values were in the small to medium effect range (*ds*: -0.12 to 0.61) (Table 2). Trauma type was determined as either a sexual (e.g., childhood sexual abuse, rape) or nonsexual (e.g., car accident, loss of a loved one, childhood physical abuse) trauma utilizing each participant's self-indicated most distressing trauma. A full breakdown of self-reported most distressing traumas by trauma type are presented in Table 3. This breakdown is similar to other studies that have addressed multiple trauma types (Breslau et al., 1998). Lastly, independent group *t*-tests indicated significant differences between those who had sought mental health treatment (lifetime) and those who had not on the following variables: physical health issues ($t = -2.67, p <$

0.01), depressive symptom severity ($t = -2.84, p < 0.01$) and physical health quality of life ($t = 2.05, p < 0.05$).

A Holm-Bonferroni correction was utilized to correct for five comparisons, yielding a corrected alpha of 0.01. Significant positive correlations were found between PTS severity and depressive symptom severity ($r = 0.54, p < 0.001$), chronicity of the most distressing trauma ($r = 0.21, p = 0.017$) and number of traumas ($r = 0.22, p = 0.012$). Posttraumatic stress symptom severity was not related to age at the time of the most distressing trauma or time elapsed since the most distressing trauma. Independent group t -tests indicated no significant differences between genders on PTS severity or anxiety sensitivity total scores.

Associations between PTS severity, Anxiety Sensitivity and Negative Outcomes

Zero-order correlations highlighted significant associations between PTS severity and all of the outcomes evaluated including, physical health issues ($r = 0.45, p < 0.01$), physical health quality of life ($r = -0.28, p < 0.01$), psychological health quality of life ($r = -0.42, p < 0.01$), social functioning quality of life ($r = -0.31, p < 0.01$), environmental quality of life ($r = -0.24, p < 0.01$), work related disability ($r = 0.56, p < 0.01$), social functioning related disability ($r = 0.75, p < 0.01$), family functioning related disability ($r = 0.56, p < 0.01$) and burden ($r = 0.28, p < 0.01$) (Table 4). Similarly, zero-order correlations highlighted significant correlations between AS and all of the outcomes evaluated including, physical health issues ($r = 0.38, p < 0.01$), physical health quality of life ($r = -0.33, p < 0.01$), psychological health quality of life ($r = -0.47, p < 0.01$), social functioning quality of life ($r = -0.36, p < 0.01$), environmental quality of life ($r = -0.35, p < 0.01$), work related disability ($r = 0.36, p < 0.01$), social functioning related disability ($r = 0.49, p < 0.01$), family functioning related disability ($r = 0.46, p < 0.01$) and burden ($r = 0.42, p < 0.01$) (Table 4).

Moderation Analyses

Two moderation analyses were conducted to examine the role of AS and depressive symptom severity in the relationship between PTS severity and negative outcomes. The negative outcomes utilized in these analyses included physical health issues and the four domains of quality of life (i.e., physical, psychological, social and environmental). When looking at AS, step 1 of the hierarchical regression revealed PTS severity to be a predictor of physical health issues ($\beta = 0.45$, $R^2 = 0.20$, $p < 0.001$) as well as a predictor of diminished quality of life across all domains (physical health quality of life, $\beta = -0.28$, $R^2 = 0.08$, $p < 0.01$; psychological health quality of life, $\beta = -0.42$, $R^2 = 0.17$, $p < 0.001$; social functioning quality of life, $\beta = -0.31$, $R^2 = 0.10$, $p < 0.001$; environmental quality of life, $\beta = -0.24$, $R^2 = 0.06$, $p < 0.01$). Step 2 indicated that AS predicted diminished quality of life across all domains above and beyond PTS severity (physical health quality of life, $\beta = -0.25$, $R^2 = 0.12$, $p < 0.05$; psychological health quality of life, $\beta = -0.35$, $R^2 = 0.25$, $p < 0.01$; social functioning quality of life, $\beta = -0.28$, $R^2 = 0.14$, $p < 0.05$; environmental quality of life, $\beta = -0.33$, $R^2 = 0.12$, $p < 0.01$). Anxiety sensitivity did not predict physical health issues above and beyond that of PTS severity. Step 3 revealed no interaction between PTS severity and AS.

When utilizing depressive symptom severity as a moderating variable, step 1 indicated a significant relationship between PTS severity and physical health issues and all four domains of quality of life. Step 2 indicated that depressive symptom severity predicted diminished quality of life across all domains above and beyond PTS severity (physical health quality of life, $\beta = -0.37$, $R^2 = 0.18$, $p < 0.001$; psychological health quality of life, $\beta = -0.58$, $R^2 = 0.42$, $p < 0.001$; social functioning quality of life, $\beta = -0.44$, $R^2 = 0.24$, $p < 0.001$; environmental quality of life, $\beta = -0.36$, $R^2 = 0.15$, $p < 0.01$). Depressive symptom severity did not significantly predict physical

health issues above and beyond that of PTS severity. Step 3 revealed no interaction between PTS severity and depressive symptom severity. This set of analyses revealed that the relationship between PTS severity and negative outcomes such as physical health issues and quality of life is not moderated by AS or depressive symptom severity.

Due to the small to moderate effect sizes indicating a possible difference between sexual and nonsexual trauma types on negative outcomes, all of the above moderational analyses were repeated with trauma type controlled for in the analyses. These analyses revealed that trauma type was not a meaningful variable in the interactions between PTS and AS or PTS and depressive symptom severity on negative outcomes.

Mediational Analyses

Bootstrapping mediational analyses were used to determine the potential mediating roles of both AS and PTS with physical health issues as the outcome variable. Two separate bootstrapping analyses were run with $k = 5,000$, generating 95% confidence intervals to estimate the direct path (Table 5). In the first analysis, PTS severity was entered as the independent variable, AS as the mediating variable, and physical health issues as the dependent variable. Bootstrapping confidence intervals revealed that AS did not mediate the relationship between PTS severity and physical health issues (0.02; 95% CI -0.01 to 0.07). The reciprocal relationship was tested with AS entered as the independent variable, PTS severity as the mediating variable and physical health issues as the dependent variable. Bootstrapping confidence intervals revealed that PTS severity mediated the relationship between AS and physical health issues (0.05; 95% CI 0.02 to 0.08) such that the relationship between AS and physical health issues is dependent on PTS severity.

Burden Descriptive Statistics

The burden of PTS in traumatized adults was examined to determine rates of physical and mental health care utilization and stigma related to mental health treatment. In the last year, approximately 22% of the sample had not received physical health care services and the majority of students (65.6%) had utilized physical health care services between one and five times over the past year. Approximately 58% of the sample had received mental health treatment in their lifetime, with 23% having received psychiatric medication, approximately 46% having received outpatient mental health treatment, and 11.5% having received inpatient mental health treatment. Approximately 7% of the sample had received mental health treatment in the last month, 13% in the last six months, 8% in the past year and over 32% had received treatment more than one year ago.

When questioned about whether they would seek treatment should a mental health problem arise, 0.8% said definitely not, 26.2% said probably not, 45.1% said probably yes, and 27.9% said definitely yes. When asked how comfortable they would feel seeking mental health treatment, 2.5% stated they would not feel at all comfortable, 21.3% stated they would not feel very comfortable, 49.2% stated they would feel somewhat comfortable and 27% stated they would feel very comfortable. When asked how embarrassed they would feel should a friend find out they were seeking mental health treatment, 11.5% stated they would feel very embarrassed, 24.6% stated they would feel somewhat embarrassed, and 63.9% stated they would feel either not very or not at all embarrassed.

Discussion

The current study reported on several factors that are related to PTS severity as well as factors that contribute to the relationship between PTS and negative outcomes in traumatized adults. The study sheds light on the role of anxiety sensitivity in the relationship between PTS and negative outcomes. Associations between PTS severity and both clinical and trauma-related variables were explored. Consistent with previous research, PTS severity was positively correlated with depressive symptom severity (Hirth & Berenson, 2012b; Kroll et al., 1989). There are three possible explanations for this finding which, due to the retrospective nature of this study, are speculative in nature. First, individuals exposed to traumatic events may experience a shared vulnerability for the development of PTS and depressive symptoms (O'Donnell et al., 2004). Second, the presence of pre-trauma depressive symptoms may increase the vulnerability to PTS following a traumatic event (Breslau et al., 1997). Third, the presence of debilitating and upsetting PTS symptoms may contribute to an increased vulnerability to depressive symptoms (Breslau et al., 1997). It is also important to consider that symptoms of dysphoria and general distress may be shared features of both PTSD and major depressive disorder and contribute to the presentation of both disorders following a traumatic event. Considering this information, it is likely that the presence of depressive symptoms is associated with increased symptom burden and therefore more severe expressions of PTS. It is possible that a similar experience related to anxious re-experiencing of the event (i.e., PTS) and depressive ruminations about the traumatic event (i.e., major depressive disorder) may contribute to the maintenance of both PTS and major depressive disorder following trauma. Individuals with both

PTS and depressive symptoms may have more severe depression, lower social support, more frequent health care utilization and more suicidal ideation as compared to individuals with depression alone (Campbell et al., 2007) and more severe PTS and higher levels of disability as compared to those with PTSD alone (Mormartin, Silove, Manicavasagar, & Steel, 2004).

Posttraumatic stress symptom severity was also positively correlated with chronicity of the most distressing trauma (Elliott, 1997; Goldsmith et al., 2004) and number of traumas (Deering et al., 1996; McCutcheon et al., 2010). Though these variables differ significantly, their positive association with PTS severity may both be explained by the concept of cumulative stress and its impact on disease burden (Turner & Lloyd, 1995). This concept was first highlighted by Turner and Lloyd (1995) when they illustrated that cumulative stress due to chronic or multiple traumatic events over time leads to both increased psychological distress and increased occurrence of psychopathological disorders (e.g., PTSD, depression). Additionally, they hypothesized that chronic or multiple traumas place individuals at an increased risk for concurrent stressors (e.g., financial difficulties) and hinder the development of adequate coping skills needed for dealing with the after effects of trauma (Turner & Lloyd, 1995).

Inconsistent with predictions, there were no significant gender differences on PTS severity. This may reflect inconsistencies in the literature with some studies finding females to have more severe PTS (North et al., 2012; Skopp et al., 2011) and others indicating the opposite (Iverson et al., 2011; Maguen et al., 2010). One of the most common hypotheses underlying this gender disparity highlights the relative reluctance of males to report symptoms (Brewin et al., 2000). However, it is possible that the subsample of males that chose to take part in a trauma-related self-report study may be more willing to disclose symptoms than those that participate in a study that involves clinical interview. If this hypothesis stands true than one could argue that

the difference in PTS severity between genders is more a representation of accuracy in reporting than in true symptom severity variances. However, given the strength of the finding in a meta-analytic review by Tolin and Foa (2006) that females are significantly more likely to meet criteria for PTSD than males, other explanations must be considered. One such explanation is that the subsample of males that self-identify as “traumatized” and are willing to participate in a self-report study on trauma may have significantly more severe PTS than males who have experienced trauma but do not self-identify as having been traumatized. Therefore, the lack of gender disparity in this sample may be due to an abnormally severe group of males or a less severe group of females as compared to those used in other studies. Lastly, it is important to keep in mind that a meta-analysis of military samples found a similar lack of difference between males and females on PTS severity (Brewin et al., 2000) highlighting the fact that there is limited consensus across empirical, meta-analytic and epidemiological studies regarding gender and PTS severity.

Both age at the time of the most distressing trauma as well as time elapsed since the most distressing trauma were not associated with PTS severity. One possible explanation for why these results differ from much of the extant literature (Applebaum & Burns, 1991; McCutcheon et al., 2010) is the low rate of current mental health treatment utilization among this sample. Given that PTSD does not typically remit on its own (National Center for PTSD, 2011) it is possible that despite the elapsing of time since the trauma the individuals in this sample continue to experience PTS due to a lack of mental health treatment utilization. It is also likely that utilizing the “most distressing trauma” variable for these analyses did not take into account the possibility of re-traumatization after the most distressing event occurred, therefore skewing the true time elapsed since the trauma and the age when last traumatized.

Type of most distressing trauma (i.e., sexual or nonsexual) was not significantly related to PTS, AS, physical health issues, or any of the quality of life domains. However, these non-significant results may be a function of inadequate power which was 0.66. The magnitude of the effect sizes ranging from small to medium may be suggestive of possible differences between those with sexual trauma versus those with nonsexual trauma in the areas of physical health issues as well as social and psychological quality of life. Importantly, the role of trauma type was not consistently meaningful among the various outcomes and it is difficult to determine whether these results relay a clinically significant difference.

There were strong associations between PTS severity, as well as AS severity and all of the outcomes evaluated including four domains of quality of life, three domains of disability and burden. Specifically, PTS severity and AS severity were both negatively related to physical, psychological, social and environmental quality of life and positively related to work related, social functioning related and family functioning related disability as well as burden. These findings reflect on the lack of general well-being felt by those with more severe PTS and/or more severe AS. Due to the nature of PTS and the hallmark avoidance symptoms, persons with more severe PTS may refrain from participating in both social and occupational activities. This isolation may be associated with work, social and family related disability as well as diminished psychological, social and environmental quality of life. It is also likely that the hesitance to participate in school/work related obligations contributes to missed or inefficient work days, thereby influencing burden. Similarly, those with heightened AS may avoid certain activities that they believe will provoke anxiety as anxiety is a feared sensation (Hembree & Foa, 2010).

Consistent with previous research that highlights a strong association between PTS and physiological problems (Fetzner, Collimore, et al., 2012; Qureshi et al., 2009) a significant

positive correlation was found between PTS severity and physical health issues. Additionally, PTS severity was negatively related to physical health quality of life. These findings may be explained in several ways. First, the dysregulation of the hypothalamic-pituitary-adrenal (HPA) axis may contribute to the relationship between PTS severity and physical health issues as the body's hormonal imbalances relate to physiological symptoms (McKeever & Huff, 2003). Second, the presence of hyperarousal symptoms such as insomnia and irritability may be related to the presence of somatic complaints (Boals, Riggs, & Kraha, 2013). Additionally, there were strong correlations between AS severity and physical health issues as well as physical health quality of life. Those with elevated levels of AS have been shown to fear innocuous stimuli and situations and oftentimes go to great lengths to avoid such encounters (Asmundson, Norton, & Norton, 1999). This avoidance may in turn impact physical health issues in two ways. First, persons with elevated AS may be more likely to interpret unpleasant physical sensations (e.g., pain) as dangerous thereby increasing avoidance behaviors (Ocanez, McHugh, & Otto, 2010). This pattern of cognitions and behaviors may then lead to deconditioning and the increase of negative physical experiences, thereby contributing to the development and maintenance of chronic pain or other physical health issues (Stewart & Asmundson, 2006). Second, this increase in avoidance may contribute to a reluctance to seek out medical care for somatic symptoms, which in turn may lead to the maintenance or worsening of physical health issues.

Posttraumatic stress severity, anxiety sensitivity and depressive symptom severity were associated with diminished quality of life. The main effects of PTS severity, AS severity and depressive symptom severity represent the unique contribution of each set of symptoms on quality of life, with both AS and depressive symptom severity exerting effects over and above those of PTS severity on all four quality of life domains. Interestingly, AS and depressive

symptom severity did not exert effects above and beyond those of PTS severity on physical health issues, indicating the strength of the relationship between PTS and physical health issues. This finding is interesting given the highly investigated comorbidity between depression and physical health issues (Ostergaard & Foldager, 2011; Steptoe, 2007). No interactions were found between PTS severity and AS severity or depressive symptom severity in predicting diminished quality of life or physical health issues in traumatized adults. Non-significant interactions indicate that the strengths of the relationship between PTS and AS or PTS and depression symptoms do not outweigh the unique main effects contributed by each factor alone.

Unique to this study was the investigation of a reciprocal mediating relationship addressing the roles of PTS and AS in relationship with physical health issues. Posttraumatic stress severity mediated the relationship between AS and physical health issues. Though it is not possible to determine whether the individuals in this study had heightened AS prior to the trauma, the mediation analysis allows for an approximation of this pathway in a retrospective study indicating that those with heightened AS may have heightened PTS which may then lead to physical health issues. The degree to which PTS directly impacted physical health issues suggests that PTS severity may be an underlying mechanism driving the relationship between AS and physical health issues. Heightened AS may impact the level of PTS experienced by traumatized individuals, which then impacts their experience with physical health issues. Specifically, individuals with high levels of AS may interpret both the traumatic event as well as their adverse reactions to the event as highly distressing. Additionally, traumatic events may lead to the development or heightening of AS as individuals become conditioned to previously innocuous stimuli as newly threatening (Marshall et al., 2010). As their anxiety increases and PTS severity heightens, avoidance symptoms may become more prevalent. Both the avoidance

symptoms as well as the hyperarousal symptoms of PTS may influence the presence of physical health issues in traumatized adults. Avoidance symptoms may reduce participation in routine (e.g., going to work), pleasurable (e.g., seeing friends) or health-related (e.g., going to the gym) activities, all of which may contribute to amplified somatic complaints and the development and maintenance of chronic medical conditions. The inability to participate in activities may increase distress and impede on chronic illness coping, thereby limiting the self-care and health-care utilization of these individuals.

A reciprocal relationship utilizing AS as a mediating variable was not found, indicating that the relationship between PTS and physical health issues was not mediated by AS. Unique to this study was the implementation of this relationship in a mediational analysis that addressed the relationship between PTS, AS and physical health issues. In accordance with the finding that PTS mediated the relationship between AS and physical health issues and AS did not mediate the relationship between PTS and physical health issues, there was a lack of evidence for a reciprocal relationship when physical health issues is utilized as the outcome variable. However, consistent with Marshall et al. (2010), the reciprocal relationship between AS and PTS, such that AS severity predicts PTS severity and PTS severity predicts AS severity, was highlighted by the set of mediational analyses.

With high rates of PTS, AS and physical health issues in this sample, it is comforting that the rates of health care utilization were consistent with those found nationally. Approximately 78% of the sample had received physical health care services in the last year. This number is consistent with the 81% found by a national survey of college students (N = 32,133) regarding health care utilization in the last year (Eisenberg, Hunt, Speer, & Zivin, 2011). Approximately 28% of the sample had received mental health treatment in the last year which is slightly less

than the 35.6% found nationally (percentage of students with at least one mental health problem seeking mental health treatment in the past year) (Eisenberg et al., 2011). Given the rate of PTS, AS and depression in this sample of traumatized adults one might expect a higher rate of mental health care utilization. This low percentage is concerning and may be due to PTS-related avoidance symptoms, a hallmark of PTSD and a symptom cluster that is not typically found as intensely in other common mental health disorders among college students (e.g., depression, generalized anxiety, non-suicidal self-injury). Additionally, stigma related to mental health treatment utilization can be summarized via the following information: approximately 30% of the sample stated that they would be unlikely to seek mental health services should a problem arise, almost 25% stated that they would not feel comfortable discussing a mental health problem with a mental health professional and approximately 35% of the sample stated they would be embarrassed should a friend find out they were seeking mental health treatment. The anticipation of a negative response from friends or family members is one factor that contributes to the stigma related to mental health care and influences the reluctance of individuals to seek necessary treatment. It is also hypothesized that seeking out help for a mental health problem resembles an open admission of inadequacy, something many individuals are hesitant to do (Zartaloudi & Madianos, 2010).

Limitations

This study is not without limitations. First, the study utilized a self-report measure for the assessment of PTS. Though important in allowing the study to test the full range of PTS severity, the presence of common-method variance must be considered. Having a clinician-administered measure of PTS would help remedy the influence of method variance but may lead to a truncated range of PTS due to heightened avoidance symptoms among those with more severe PTS.

Second, this study consisted of a relatively homogeneous sample in that all of the subjects were recruited on a college campus and therefore generalizability to a more diverse population is limited. On balance, a wide range of ages and ethnicities were covered within the sample. Third, due to the cross-sectional nature of this study, causality cannot be assumed. It is possible that those with more physical health issues are at greater risk for the development of more severe PTS. However, it is important to note that direct pathways are illustrated by the mediational analyses indicating a possible causative role of PTS in the association between AS and physical health issues (Hayes, 2009).

Implications

This study highlights the contributing factors related to PTS severity as well as those that contribute to the negative outcomes commonly associated with PTS. Understanding these factors is helpful for clinicians to identify at risk populations and allows for the incorporation of preventative interventions for vulnerable individuals following traumatic events. These early preventative efforts may yield significant decreases in the severity of PTS in traumatized adults and may function – together with other efforts – to decrease the prevalence of PTSD in traumatized adults. Specifically, this study sheds light on the association between PTS severity and trauma-related variables including chronicity of the trauma and number of traumas. Early identification of individuals who have had numerous traumatic events may allow for quicker initiation of treatment and ideally expedited remission from PTS. Additionally, evidence suggests that depressive symptom severity is also highly related to PTS severity. This finding holds significant clinical value in that individuals with a trauma history presenting with depressive symptoms may be at risk for or already experiencing PTS. Understanding that there is a strong association between depression symptoms and PTS in traumatized individuals will help

clinicians to conduct the correct assessments and treatments in order to address the multitude of symptoms experienced post-trauma.

This study also highlighted the associations between PTS, AS and negative outcomes. Although these results seem intuitive, gaining a clearer picture of the mechanisms underlying the association between PTS and negative outcomes will aid in the identification and application of interventions aimed at both the amelioration of anxiety sensitivity and ultimately improvements in functional impairment, quality of life and physical health. For example, interoceptive exposure as well as cognitive restructuring may be utilized to help reduce the physiological and cognitive symptoms of AS (Deacon & Abramowitz, 2006). The reduction of AS would ultimately influence the improvement of functional impairment and quality of life. There are also important implications related to the diminished quality of life present in many individuals with PTS. Most treatments for PTSD focus on the reduction of PTS symptoms. However, this may not be enough in alleviating individuals of their burdens, as quality of life is not often directly addressed. Treatment following a traumatic event may benefit from a foremost focus on PTS symptom reduction followed by a second goal of reducing comorbid depression symptoms and a third goal of improving quality of life. However, evidence suggests that during an empirically supported group therapy treatment for PTSD, a significant reduction in PTS was synchronous with an improvement in quality of life (Schnurr, Hayes, Lunney, McFall, & Uddo, 2006). More research is needed to help clarify the mechanisms of change for quality of life in traumatized individuals with PTS and heightened AS.

In addition to the relationship between PTS and quality of life, this study is the first to investigate the mediational relationship between PTS, AS and physical health issues. The mediational pathway highlighted by this study indicates the essential role of PTS severity in the

relationship between AS and physical health issues among traumatized adults. This finding is important in that it elucidates the influential agents impacting the high rates of physical health issues among traumatized adults. Similarly, this finding yields clinical implications for mental health and physical health professionals alike in that psychological symptoms directly affect physiological symptoms, two areas which are often treated independent of one another. Medical professionals across mental health and medical disciplines should be aware of the pathways between PTS, AS and physical health issues and assess for somatic complaints and chronic conditions among traumatized adults with PTS. Similarly, because causality cannot be inferred medical professionals should be attuned to PTS among those that present with physical health issues and make appropriate referrals for psychological and/or psychopharmacological treatment.

Lastly, this study described the burden related to traumatized adults. Burden included both missed and inefficient workdays among individuals with a trauma history. Burden was significantly related to the severity of PTS and therefore may decline with proper treatment of PTS. The stigma related to seeking mental health treatment was noteworthy in that a large portion of individuals expressed a hesitance to seek mental health treatment as well as concern regarding how they would be perceived should they seek mental health treatment. This information is concerning in that PTSD does not tend to remit on its own and may worsen without proper psychological or psychopharmacological interventions (National Center for PTSD, 2011).

Table 1.

Means (standard deviations) on study variables

| Variable | M (SD) |
|------------------------|---------------|
| DASS Depression | 4.88 (4.68) |
| DASS Anxiety | 4.00 (3.74) |
| DASS Stress | 7.10 (4.40) |
| WHOQOL Physical | 21.22 (2.88) |
| WHOQOL Psychological | 20.11 (3.13) |
| WHOQOL Social | 10.01 (2.85) |
| WHOQOL Environmental | 28.93 (5.14) |
| ASI Physical | 5.30 (5.34) |
| ASI Cognitive | 4.96 (5.39) |
| ASI Social | 9.61 (6.00) |
| ASI Total | 19.84 (14.29) |
| PCL Total | 38.86 (13.69) |
| SDS Work | 2.43 (2.73) |
| SDS Social | 3.50 (2.96) |
| SDS Family | 3.14 (2.97) |
| EIQ Chronic Conditions | 0.69 (0.93) |
| EIQ Somatic Symptoms | 3.66 (2.74) |
| EIQ Total Physical | 4.35 (3.17) |

Note: DASS, Depression Anxiety Stress Scale 21; WHOQOL, World Health Organization Quality of Life BREF; ASI, Anxiety Sensitivity Index-III; PCL, Posttraumatic Stress Disorder Checklist-Civilian; SDS, Sheehan Disability Scale; EIQ, Economic Impact Questionnaire-Revised.

Table 2.

Sexual (N= 30) versus nonsexual trauma (N= 92)

| Variable | Sexual Trauma Means (<i>SD</i>) | Nonsexual Trauma Means (<i>SD</i>) | <i>t</i> -value | Cohen's <i>d</i> |
|------------------------|--------------------------------------|---|-----------------|---------------------|
| PTS Severity | 40.30 (11.16) | 38.39 (14.45) | 0.66 | 0.15 |
| Anxiety Sensitivity | 21.33 (15.51) | 19.36 (13.92) | 0.66 | 0.13 |
| Physical Health Issues | 5.80 (3.32) | 3.88 (3.00) | 2.98 | 0.61 |
| QOL Physical | 21.30 (3.12) | 21.20 (2.81) | 0.17 | 0.03 |
| QOL Psychological | 19.37 (2.94) | 20.35 (3.17) | -1.50 | -0.32 |
| QOL Social | 9.13 (3.03) | 10.29 (2.74) | -1.96 | -0.40 |
| QOL Environmental | 28.43 (6.32) | 29.09 (4.73) | -0.60 | -0.12 |

Note: QOL = Quality of Life as measured by the World Health Organization Quality of Life-BREF

Table 3.

Participants self-reported most distressing trauma

| Trauma Type | N (percentage) |
|---|----------------|
| Crime related event (e.g., mugging) | 6 (4.9) |
| General disaster (e.g., hurricane) | 9 (7.4) |
| Combat related experience | 3 (2.5) |
| Loss of a loved one | 40 (32.8) |
| Physical experience (e.g., assault, abuse) | 8 (6.6) |
| Sexual experience (e.g., rape, abuse) | 30 (24.6) |
| Motor vehicle accident | 15 (12.3) |
| Other trauma (e.g., emotional abuse, abandonment) | 11 (9.0) |

Table 4.

Correlations for posttraumatic stress severity and anxiety sensitivity with negative outcomes

| | Physical Health | QOL Phys | QOL Psych | QOL Soc | QOL Env | SDS Work | SDS Soc | SDS Fam | EIQ Econ |
|-----------|-----------------|----------|-----------|---------|---------|----------|---------|---------|----------|
| PCL Total | 0.45** | -0.28** | -0.42** | -0.31** | -0.24** | 0.56** | 0.75** | 0.56** | 0.28** |
| ASI Total | 0.38** | -0.33** | -0.47** | -0.36** | -0.35** | 0.36** | 0.49** | 0.46** | 0.42** |

Note: PCL total = Posttraumatic Stress Disorder Checklist-Civilian total score; ASI total = Anxiety Sensitivity Index-III total score; QOL Phys = WHO Quality of Life BREF physical subscale; QOL Psych = WHO Quality of Life BREF psychological subscale; QOL Soc = WHO Quality of Life BREF social subscale; QOL Env = WHO Quality of Life BREF environmental subscale; SDS Work = Sheehan Disability Scale work subscale; SDS Social = Sheehan Disability Scale social subscale; SDS Family = Sheehan Disability Scale family subscale; EIQ Econ = Economic Impact Questionnaire Revised economic burden score.

* $p < 0.05$, ** $p < 0.01$

Table 5.

Reciprocal mediational analyses with physical health issues as outcome variable. Data include coefficient(SE) unless otherwise specified.

| Mediators entered independently | a path | b path | c path | c' path | Indirect effects (coefficient) | 95% CI |
|---------------------------------|--------------|-------------|--------------|-------------|--------------------------------|---------------|
| Anxiety Sensitivity | 0.66(0.07)** | 0.03(0.2) | 0.10(0.02)** | 0.08(0.02)* | 0.02 | -0.01 to 0.07 |
| PTS Severity | 0.61(0.07)** | 0.08(0.02)* | 0.08(0.02)** | 0.03(0.02) | 0.05 | 0.02 to 0.08 |

* $p < 0.05$ ** $p < 0.001$

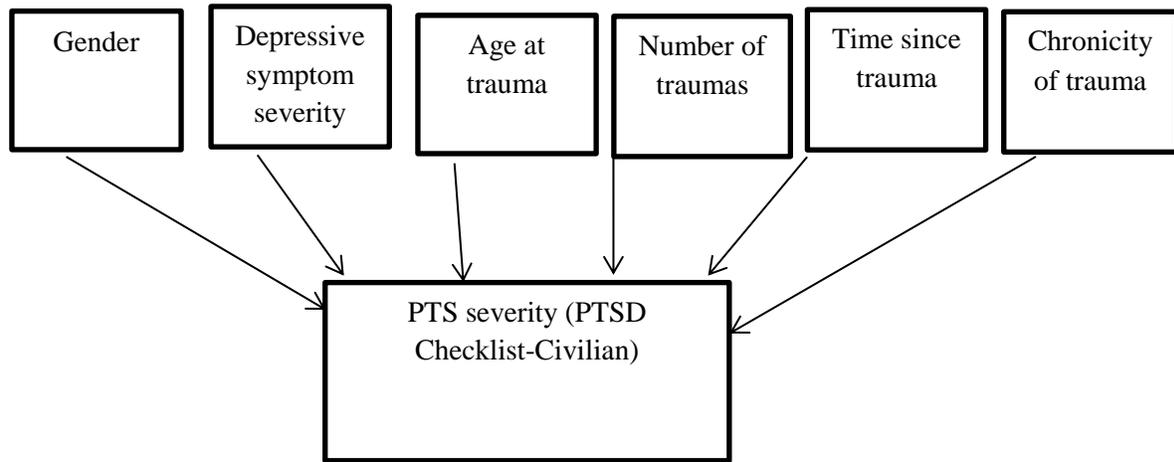


Figure 1. Factors associated with PTS severity

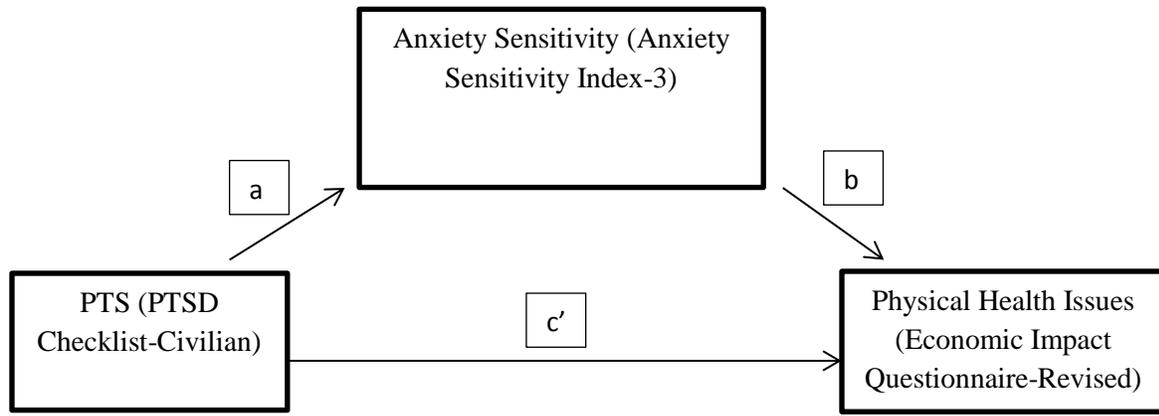


Figure 2. Mediation model of PTS and physical health issues

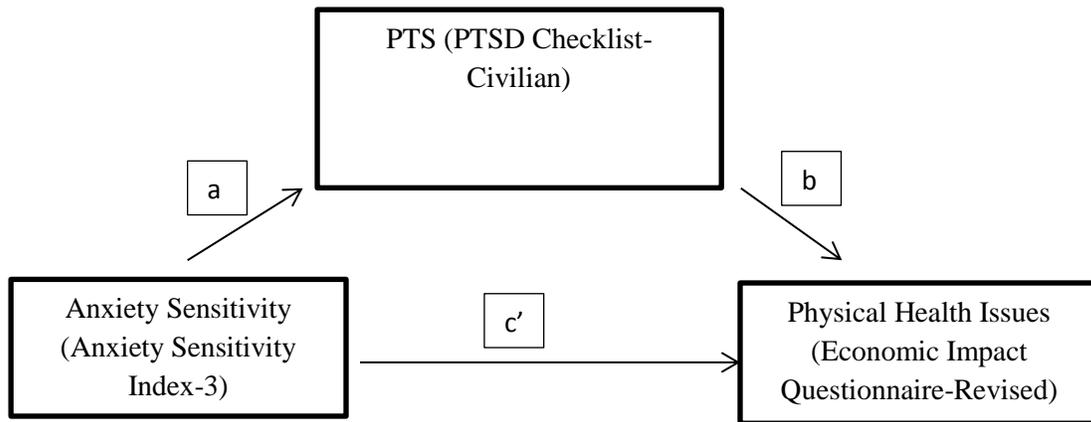


Figure 3. Mediation model of AS and physical health issues

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Appendices

Appendix A: PTSD CheckList- Civilian Version

Client's Name:

Instruction to patient: Below is a list of problems and complaints that veterans sometimes have in response to stressful life experiences. Please read each one carefully, put an "X" in the box to indicate how much you have been bothered by that problem *in the last month*.

| No. | Response | Not at all | A little bit | Moderately | Quite a bit | Extremely |
|-----|--|------------|--------------|------------|-------------|-----------|
| 1. | Repeated, disturbing <i>memories, thoughts, or images</i> | | | | | |
| 2. | Repeated, disturbing <i>dreams</i> of a stressful experience from the past? | | | | | |
| 3. | Suddenly <i>acting or feeling</i> as if a stressful experience | | | | | |
| 4. | Feeling <i>very upset</i> when <i>something reminded you of a stressful experience from the past?</i> | | | | | |
| 5. | Having <i>physical reactions</i> (e.g., heart pounding, trouble breathing, or sweating) when <i>something reminded you of a</i> | | | | | |
| 6. | Avoid <i>thinking about or talking about</i> a stressful experience from the past or avoid <i>having feelings related to it?</i> | | | | | |
| 7. | Avoid <i>activities or situations</i> because they <i>remind you of a stressful experience from</i> | | | | | |
| 8. | Trouble <i>remembering important parts</i> of a stressful experience from the past? | | | | | |
| 9. | Loss of <i>interest in things that you used to</i> | | | | | |
| 10. | Feeling <i>distant or cut off</i> from other people? | | | | | |
| 11. | Feeling <i>emotionally numb</i> or being unable to <i>have loving feelings for those close to you?</i> | | | | | |
| 12. | Feeling as if your <i>future will somehow be cut</i> | | | | | |
| 13. | Trouble <i>falling or staying asleep?</i> | | | | | |
| 14. | Feeling <i>irritable</i> or having <i>angry outbursts?</i> | | | | | |
| 15. | Having <i>difficulty concentrating?</i> | | | | | |
| 16. | Being " <i>super alert</i> " or watchful on guard? | | | | | |
| 17. | Feeling <i>jumpy</i> or easily startled? | | | | | |

PCL-M for DSM-IV (11/1/94) Weathers, Litz, Huska, & Keane National Center for PTSD - Behavioral Science Division

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Appendix B: Trauma History Questionnaire

The following is a series of questions about serious or traumatic life events. These types of events actually occur with some regularity, although we would like to believe they are rare, and they affect how people feel about, react to, and/or think about things subsequently. Knowing about the occurrence of such events, and reactions to them, will help us to develop programs for prevention, education, and other services. The questionnaire is divided into questions covering crime experiences, general disaster and trauma questions, and questions about physical and sexual experiences.

For each event, please indicate (circle) yes or no for whether it happened, and if it did, the number of times and your approximate age when it happened (give your best guess if you are not sure). Also please write in a few words explaining more about the event and the person involved, where asked.

Crime-Related Events

If Yes

of Approx. Age

Times

1. Has anyone ever tried to take something directly from you by using force or the threat of force, such as a stick-up or mugging?

No Yes _____ _____

- 2(4). Has anyone ever tried to or succeeded in breaking into your home while you were there?

No Yes _____ _____

General Disaster and Trauma

3(5). Have you ever had a serious accident at work, in a car or somewhere else?

No Yes _____

If yes, please specify

4(7). Have you ever experienced a “man-made” disaster such as a train crash, building collapse, bank robbery, fire, etc., where you felt you or your loved ones were in danger of death or injury?

No Yes _____

If yes, please specify

5(9). Have you ever been in any other situation in which you were seriously injured?

No Yes _____

If yes, please specify

If yes

Was it Approx.

repeated? What age(s)

6(10). Have you ever been in any other
situation in which you feared you
might be killed or seriously
injured?

No Yes

If yes, please specify

7(11). Have you ever seen someone
seriously injured or killed?

No Yes

If yes, please specify who

- Added: Have you ever been in combat?

8(12). Have you ever seen dead bodies
other than at a funeral) or had
to handle dead bodies for any

reason? No Yes _____

If yes, please specify

9(13). Have you ever had a close friend
or family member murdered, or
killed by a drunk driver? No Yes _____

If yes, please specify

relationship (e.g.mother,
grandson,etc.)_____

10(14). Have you ever had a spouse,
romantic partner, or child die? No Yes _____

If yes, please specify

relationship_____

11(15). Have you ever had a serious
or life-threatening illness? No Yes _____

If yes, please specify

Physical and Sexual Experiences

If Yes

Was it Approx.

repeated? How often

& what age(s) 12(18). Has anyone ever made you have

intercourse, oral or anal sex

against your will?

No Yes

If yes, please indicate

nature of relationship with

person (e.g. stranger,

friend, relative, parent,

sibling)_____

16(22). Has anyone, including family members or friends, ever attacked you without a weapon and seriously injured you? No Yes _____

17(23). Has anyone in your family ever beaten, “spanked” or pushed you hard enough to cause injury? No Yes _____

Other Events

18(24). Have you experienced any other extraordinarily stressful situation or event that is not covered above? No Yes _____

If yes, please specify.

19(25). Of the events to which you said yes, which was the most distressing to you?:

Appendix C: Anxiety Sensitivity Index-3

Please circle the number that best corresponds to how much you agree with each item. If any items concern something that you have never experienced (e.g., fainting in public), then answer on the basis of how you think you might feel *if you had* such an experience. Otherwise, answer all items on the basis of your own experience. Be careful to circle only one number for each item and please answer all items.

| | Very little | A little | Some | Much | Very much |
|---|----------------|-------------|------|------|--------------|
| 1. It is important for me not to appear nervous. | 0 | 1 | 2 | 3 | 4 |
| 2. When I cannot keep my mind on a task, I worry that I might be going crazy. | 0 | 1 | 2 | 3 | 4 |
| 3. It scares me when my heart beats rapidly. | 0 | 1 | 2 | 3 | 4 |
| 4. When my stomach is upset, I worry that I might be seriously ill. | 0 | 1 | 2 | 3 | 4 |
| 5. It scares me when I am unable to keep my mind on a task. | 0 | 1 | 2 | 3 | 4 |
| 6. When I tremble in the presence of others, I fear what people might think of me. | 0 | 1 | 2 | 3 | 4 |
| 7. When my chest feels tight, I get scared that I won't be able to breathe properly. | 0 | 1 | 2 | 3 | 4 |
| 8. When I feel pain in my chest, I worry that I'm going to have a heart attack. | 0 | 1 | 2 | 3 | 4 |

| | | | | | |
|---|---|---|---|---|---|
| 9. I worry that other people will notice my anxiety. | 0 | 1 | 2 | 3 | 4 |
| 10. When I feel “spacey” or spaced out I worry that I may be mentally ill. | 0 | 1 | 2 | 3 | 4 |
| 11. It scares me when I blush in front of people. | 0 | 1 | 2 | 3 | 4 |
| 12. When I notice my heart skipping a beat, I worry that there is something seriously wrong with me. | 0 | 1 | 2 | 3 | 4 |
| 13. When I begin to sweat in a social situation, I fear people will think negatively of me. | 0 | 1 | 2 | 3 | 4 |
| 14. When my thoughts seem to speed up, I worry that I might be going crazy. | 0 | 1 | 2 | 3 | 4 |
| 15. When my throat feels tight, I worry that I could choke to death. | 0 | 1 | 2 | 3 | 4 |
| 16. When I have trouble thinking clearly, I worry that there is something wrong with me. | 0 | 1 | 2 | 3 | 4 |
| 17. I think it would be horrible for me to faint in public. | 0 | 1 | 2 | 3 | 4 |
| 18. When my mind goes blank, I worry there is something terribly wrong with me. | 0 | 1 | 2 | 3 | 4 |

Note. Scoring: Physical concerns = sum of Items 3, 4, 7, 8, 12, 15. Cognitive concerns = sum of Items 2, 5, 10, 14, 16, 18. Social concerns = sum of Items 1, 6, 9, 11, 13, 17.

Appendix D: Depression, Anxiety and Stress Scale- 21

Name: Date:

Please read each statement and circle a number 0, 1, 2 or 3 that indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all

1 Applied to me to some degree, or some of the time

2 Applied to me to a considerable degree, or a good part of time

3 Applied to me very much, or most of the time

1 I found it hard to wind down 0 1 2 3

2 I was aware of dryness of my mouth 0 1 2 3

3 I couldn't seem to experience any positive feeling at all 0 1 2 3

4 I experienced breathing difficulty (eg, excessively rapid breathing,
breathlessness in the absence of physical exertion) 0 1 2 3

5 I found it difficult to work up the initiative to do things 0 1 2 3

6 I tended to over-react to situations 0 1 2 3

7 I experienced trembling (eg, in the hands) 0 1 2 3

8 I felt that I was using a lot of nervous energy 0 1 2 3

9 I was worried about situations in which I might panic and make
a fool of myself 0 1 2 3

10 I felt that I had nothing to look forward to 0 1 2 3

11 I found myself getting agitated 0 1 2 3

12 I found it difficult to relax 0 1 2 3

13 I felt down-hearted and blue 0 1 2 3

14 I was intolerant of anything that kept me from getting on with
what I was doing 0 1 2 3

15 I felt I was close to panic 0 1 2 3

16 I was unable to become enthusiastic about anything 0 1 2 3

- 17 I felt I wasn't worth much as a person 0 1 2 3
- 18 I felt that I was rather touchy 0 1 2 3
- 19 I was aware of the action of my heart in the absence of physical
exertion (eg, sense of heart rate increase, heart missing a beat) 0 1 2 3
- 20 I felt scared without any good reason 0 1 2 3
- 21 I felt that life was meaningless 0 1 2 3

Appendix E: Sheehan Disability Scale

Sheehan Scale (SDS)

Please circle the number that corresponds to how much your symptoms are currently interfering with various areas of life:

The symptoms have disrupted your work:



The symptoms have disrupted your social life:



The symptoms have disrupted your family life/home responsibilities:



Appendix F: WHOQOL-BREF

The following questions ask how you feel about your quality of life, health, or other areas of your life. I will read out each question to you, along with the response options. **Please choose the answer that appears most appropriate.** If you are unsure about which response to give to a question, the first response you think of is often the best one.

Please keep in mind your standards, hopes, pleasures and concerns. We ask that you think about your life **in the last four weeks.**

| | | Very poor | Poor | Neither poor nor | Good | Very good |
|----|--|-----------|------|------------------|------|-----------|
| 1. | How would you rate your quality of life? | 1 | 2 | 3 | 4 | 5 |

| | | Very dissatisfied | Dissatisfied | Neither satisfied nor | Satisfied | Very satisfied |
|----|---|-------------------|--------------|-----------------------|-----------|----------------|
| 2. | How satisfied are you with your health? | 1 | 2 | 3 | 4 | 5 |

The following questions ask about **how much** you have experienced certain things in the last four weeks.

| | | Not at all | A little | A moderate | Very much | An extreme |
|----|--|------------|----------|------------|-----------|------------|
| 3. | To what extent do you feel that physical pain prevents you from doing what you need to do? | 5 | 4 | 3 | 2 | 1 |
| 4. | How much do you need any medical treatment to function in your daily life? | 5 | 4 | 3 | 2 | 1 |
| 5. | How much do you enjoy life? | 1 | 2 | 3 | 4 | 5 |
| 6. | To what extent do you feel your life to be meaningful? | 1 | 2 | 3 | 4 | 5 |

| | | Not at all | A little | A moderate | Very much | Extremely |
|----|---|------------|----------|------------|-----------|-----------|
| 7. | How well are you able to concentrate? | 1 | 2 | 3 | 4 | 5 |
| 8. | How safe do you feel in your daily life? | 1 | 2 | 3 | 4 | 5 |
| 9. | How healthy is your physical environment? | 1 | 2 | 3 | 4 | 5 |

The following questions ask about how completely you experience or were able to do certain things in the last four weeks.

| | | Not at all | A little | Moderately | Mostly | Completely |
|-----|--|------------|----------|------------|--------|------------|
| 10. | Do you have enough energy for everyday life? | 1 | 2 | 3 | 4 | 5 |
| 11. | Are you able to accept your bodily appearance? | 1 | 2 | 3 | 4 | 5 |
| 12. | Have you enough money to meet your needs? | 1 | 2 | 3 | 4 | 5 |
| 13. | How available to you is the information that you need in your day-to-day life? | 1 | 2 | 3 | 4 | 5 |
| 14. | To what extent do you have the opportunity for leisure activities? | 1 | 2 | 3 | 4 | 5 |

| | | Very poor | Poor | Neither poor nor | Good | Very good |
|-----|--------------------------------------|-----------|------|------------------|------|-----------|
| 15. | How well are you able to get around? | 1 | 2 | 3 | 4 | 5 |

| | | Very dissatisfied | Dissatisfied | Neither satisfied nor | Satisfied | Very satisfied |
|-----|--|-------------------|--------------|-----------------------|-----------|----------------|
| 16. | How satisfied are you with your sleep? | 1 | 2 | 3 | 4 | 5 |
| 17. | How satisfied are you with your ability to perform your daily living activities? | 1 | 2 | 3 | 4 | 5 |
| 18. | How satisfied are you with your capacity for work? | 1 | 2 | 3 | 4 | 5 |
| 19. | How satisfied are you with yourself? | 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|-----|---|---|---|---|---|---|
| 20. | How satisfied are you with your personal relationships? | 1 | 2 | 3 | 4 | 5 |
| 21. | How satisfied are you with your sex life? | 1 | 2 | 3 | 4 | 5 |
| 22. | How satisfied are you with the support you get from your friends? | 1 | 2 | 3 | 4 | 5 |
| 23. | How satisfied are you with the conditions of your living place? | 1 | 2 | 3 | 4 | 5 |
| 24. | How satisfied are you with your access to health services? | 1 | 2 | 3 | 4 | 5 |
| 25. | How satisfied are you with your transport? | 1 | 2 | 3 | 4 | 5 |

The following question refers to how often you have felt or experienced certain things in the last four weeks.

| | | | | | | |
|-----|--|-------|--------|-------------|------------|--------|
| | | Never | Seldom | Quite often | Very often | Always |
| 26. | How often do you have negative feelings such as blue mood, despair, anxiety, depression? | 5 | 4 | 3 | 2 | 1 |

Do you have any comments about the assessment?

[The following table should be completed after the interview is finished]

| | | Equations for computing domain scores | Raw score | Transformed scores* | |
|-----|-----------------|--|-----------|---------------------|-------|
| | | | | 4-20 | 0-100 |
| 27. | Domain 1 | $(6-Q3) + (6-Q4) + Q10 + Q15 + Q16 + Q17 + Q18$ † + † + † + † + † + † + † | a. = | b: | c: |
| 28. | Domain 2 | $Q5 + Q6 + Q7 + Q11 + Q19 + (6-Q26)$ † + † + † + † + † + † | a. = | b: | c: |
| 29. | Domain 3 | $Q20 + Q21 + Q22$ † + † + † | a. = | b: | c: |
| 30. | Domain 4 | $Q8 + Q9 + Q12 + Q13 + Q14 + Q23 + Q24 + Q25$ † + † + † + † + † + † + † + † + † | a. = | b: | c: |

Appendix G: Economic Impact Questionnaire-Revised-Student Version

Adapted from the National Comorbidity Study and Tolin, Frost, Steketee, Gray & Fitch (2008)

How many hours do you spend on school related work in an average week?

_____ Hours per week

How many hours do you spend on non-school related work in an average week?

_____ Hours per week

In the past 12 months were put on academic probation?

- a) Yes
- b) No

In the past 12 months did you have a scare that you might drop out of or fail school?

- a) Yes
- b) No

The next questions ask about all the things you normally do on a day-to-day basis, including your school and leisure activities. Beginning yesterday and going back 30 days, how many days out of the past 30 were you totally unable to work, go to school or carry out your normal activities?

- a) Zero
- b) One
- c) More than one: _____ Specify number

How many of these days were due to your nerves, mental health or use of alcohol or drugs? # of days _____

How many days out of the past 30 were you able to work, go to school and carry out your normal activities, but had to cut down on what you did or did not get as much done as usual?

- a) Zero
- b) One
- c) More than one: _____ Specify number

How many of these days were due to your nerves, mental health, or use of alcohol or drugs?
_____ # OF DAYS

How many days out of the past 30 did it take an extreme effort to perform up to your usual level at work/school or at your other normal daily activities?

- a) Zero
- b) One
- c) More than one: _____ Specify number

How many of these days were due to your nerves, mental health or use of alcohol or drugs?
_____ # OF DAYS

Medical Costs:

Have you experienced any of the following health problems? Please circle all that apply:

- a) Arthritis, rheumatism, or other bone or joint diseases.
- b) Asthma, bronchitis, emphysema, tuberculosis, or other lung problems
- c) HIV/AIDS
- d) Blindness, deafness, or severe visual or hearing impairment
- e) High blood pressure or hypertension
- f) Diabetes or high blood sugar
- g) Heart attack or other serious heart trouble
- h) Severe hernia or rupture
- i) Severe kidney or liver disease
- j) Lupus, or other autoimmune disorders
- k) Thyroid disease
- l) Multiple sclerosis, epilepsy, or other neurological disorders
- m) Chronic stomach or gall bladder trouble
- n) Stroke
- o) Ulcer
- p) Cancer or malignant tumor of any kind. Specify type: _____

- q) Fibromyalgia
- r) Chronic fatigue syndrome
- s) Chronic Lyme disease
- t) Other: _____

Have you experienced any of the following health problems? Please circle all that apply:

- a) Stomach pain
- b) Back pain
- c) Pain in your arms, legs or joints (knees, hips, etc)
- d) Menstrual cramps or other problems with your periods
- e) Pain or problems during sexual intercourse
- f) Headaches
- g) Chest pain
- h) Dizziness
- i) Fainting spells
- j) Feeling your heart pound or race
- k) Shortness of breath
- l) Constipation, loose bowels, or diarrhea
- m) Nausea, gas or indigestion

How much do your health problems limit you in doing things that most people your age are able to do?

- a) a lot
- b) some
- c) a little
- d) not at all

How much pain do you experience as a result of your health problems?

- a) a lot
- b) some
- c) a little
- d) none at all

How much do health problems put you at risk of early death compared to other people your age?

- a) a lot
- b) some
- c) a little
- d) not at all

How frequently have you visited a medical facility for treatment in the past 12 months?

- a) Never
- b) One time
- c) 2-5 times
- d) 6-9 times
- e) 10-13 times
- f) Greater than 13 times

Mental Health Costs:

People differ a lot in their feelings about professional help for emotional problems. If you had a serious emotional problem, would you definitely go for professional help, probably go, probably not go, or definitely not go for professional help?

- a) Definitely go
- b) Probably go
- c) Probably not go
- d) Definitely not go

How comfortable would you feel talking about personal problems with a professional?

- a) very comfortable
- b) somewhat comfortable
- c) not very comfortable
- d) not at all comfortable

How embarrassed would you be if your friends knew you were getting professional help for an emotional problem?

- a) very embarrassed
- b) somewhat embarrassed
- c) not very embarrassed
- d) not at all embarrassed

Have you ever in your lifetime received mental health treatment from a psychologist, psychiatrist or mental health worker?

- a) Yes
- b) No

What type of treatment did you receive? Circle all that apply:

- a) Medication

- b) Outpatient therapy
- c) Inpatient therapy
- d) Other: _____

How many different times in your lifetime has this occurred?

- a) Never
- b) One time
- c) Two times
- d) Three times
- e) Four times or greater

Was this in the past month, past six months, past year, or more than a year ago?

- a) Past month
- b) Past six months
- c) Past year
- d) More than a year ago

Appendix H: Informed Consent to Participate in Research



Informed Consent to Participate in Research Information to Consider Before Taking Part in this Research Study

IRB Study # 11193

You are being asked to take part in a research study. Research studies include only people who choose to take part. This document is called an informed consent form. Please read this information carefully and take your time making your decision. Ask the researcher or study staff to discuss this consent form with you, please ask him/her to explain any words or information you do not clearly understand. The nature of the study, risks, inconveniences, discomforts, and other important information about the study are listed below.

We are asking you to take part in a research study called:

The role of anxiety sensitivity in the relationship between posttraumatic stress symptoms and negative outcomes in trauma-exposed adults

The person who is in charge of this research study is Brittany Kugler. This person is called the Principal Investigator. However, other research staff may be involved and can act on behalf of the person in charge. She is being guided in this research by Dr. Eric Storch and Dr. Vicky Phares.

The research will be conducted at the Psychology and Communication Disorders (PCD) building on the Tampa Campus at the University of South Florida.

Purpose of the study

The purpose of this study is to:

Examine several influential variables related to posttraumatic stress symptom severity following trauma and determine the role of anxiety sensitivity in the relationship between posttraumatic stress symptoms and various negative outcomes. This study is being conducted as a dissertation project by an advanced doctoral student.

Study Procedures

If you take part in this study, you will be asked to:

Respond to several self-report measures electronically that ask about various aspects related to trauma and mental/physical health. You will arrive at the designated location in the PCD building of USF's Tampa

campus. After receiving informed consent you will fill out the above mentioned measures on a laptop. No identifying information will be asked of you and all of the information you provide will be anonymous. You will be provided with an ID number, that contains no identifying information, to enter into the survey.

Total Number of Participants

At least 81 individuals will take part in this study at USF.

Alternatives

You do not have to participate in this research study.

Benefits

We are unsure if you will receive any benefits by taking part in this research study.

Risks or Discomfort

The following risks may occur:

You may experience mild discomfort resulting from answering the questionnaires and thinking about potentially difficult topics. Although the aim of the investigation is to protect the anonymity of the participants, there are always risks involved. Investigators will take every measure to protect the participants' anonymity by enforcing multiple layers of security. Such measures will include making sure that the participant's IP address is untraceable and storing data in password protected network drives. Furthermore, only the Rothman Center research group will have access to the data provided by participants and the data will not be linked with identifying information.

Compensation

You will be paid \$10 if you complete the scheduled study visit and are not receiving credit through SONA. Through SONA you will receive 1 credit point.

Privacy and Confidentiality

We will keep your study records private and confidential. Certain people may need to see your study records. By law, anyone who looks at your records must keep them completely confidential. The only people who will be allowed to see these records are:

- The research team, including the Principal Investigator, study coordinator, and all other research staff.
- Certain government and university people who need to know more about the study. For example, individuals who provide oversight on this study may need to look at your records. This is done to make sure that we are doing the study in the right way. They also need to make sure that we are protecting your rights and your safety.
- Any agency of the federal, state, or local government that regulates this research. This includes the Department of Health and Human Services (DHHS) and the Office for Human Research Protection (OHRP).
- The USF Institutional Review Board (IRB) and its related staff who have oversight responsibilities for this study, staff in the USF Office of Research and Innovation, USF Division of Research Integrity and Compliance, and other USF offices who oversee this research.

We may publish what we learn from this study. If we do, we will not include your name. We will not publish anything that would let people know who you are.

Voluntary Participation / Withdrawal

You should only take part in this study if you want to volunteer. You should not feel that there is any pressure to take part in the study. You are free to participate in this research or withdraw at any time. There will be no penalty or loss of benefits you are entitled to receive if you stop taking part in this study. Decision to participate or not to participate will not affect your student status.

You can get the answers to your questions, concerns, or complaints

If you have any questions, concerns or complaints about this study, or experience an adverse event or unanticipated problem, call Brittany Kugler at 914-439-0488

If you have questions about your rights as a participant in this study, general questions, or have complaints, concerns or issues you want to discuss with someone outside the research, call the USF IRB at (813) 974-5638.