August 2022

Gender and PTSD: An Examination of Socialized Masculinity as Moderator of PTSD Symptom Development

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GENDER AND PTSD: AN EXAMINATION OF SOCIALIZED MASCULINITY AS MODERATOR OF PTSD SYMPTOM DEVELOPMENT

by

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A Dissertation Submitted in

Partial Fulfillment of the

Requirements for the Degree of

Doctor of Philosophy

in Educational Psychology

at

The University of Wisconsin – Milwaukee

August 2022

ABSTRACT

GENDER AND PTSD: AN EXAMINATION OF SOCIALIZED MASCULINITY AS MODERATOR PTSD SYMPTOM DEVELOPMENT

by

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The University of Wisconsin – Milwaukee, 2022
Under the supervision of Dr. Stephen Wester

This study seeks to explain observed gender differences in PTSD risk and protective factors and subsequent PTSD symptoms by use of a Masculine Heuristic moderator variable. Drawing from heuristic and gender role theories, this study utilizes a sample of male and female trauma survivors to examine the interaction between a Masculine Heuristic style and trauma exposure in the development of PTSD symptoms. Structural Equation Modeling and moderation analysis were used to explore these constructs. Results are discussed and incorporated into current literature, while limitations of the current study and suggestions for future research are explored.

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ACKNOWLEDGEMENTS

First, I want to thank my advisor, Dr. Stephen Wester, for his patience, honesty, and support throughout this process. The long haul of completing a Ph.D. and this dissertation was not without hurdles and I am incredibly appreciative of your guidance over the past 5 years. You helped shape an interest in gender roles into this research and a clinical future.

To my committee members, Dr. Christina Hove, Dr. Dimitri Topitzes, and Dr. Xu Li, thank you for your support and candid conversations regarding not only this research, but the how it relates to the field of psychology, trauma, and practice. Dr. Hove, I am especially grateful for your clinical guidance early in my work with trauma and so admire your clinical presence and passion.

To my husband and my parents, I wouldn't be here without your love, support, and encouragement. You were beside me through it all and mastered the balance of keeping me on track while also providing much needed distraction and encouragement to enjoy life too. To my friends and family who have cheered me on through an undergraduate, master's, and now a doctoral degree. And finally, to my dog who just might qualify for an honorary degree for hours put in beside me.

CHAPTER 1

INTRODUCTION

Significance of the Problem

Research has implicated a wide range of differences between genders in the experience of trauma and the development of post-traumatic stress disorder (PTSD) (Olff et al., 2007). Studies consistently show that endorsement of a lifetime history of trauma exposure is significantly more common among men than it is among women (Kessler et al., 2005, 2017; Olff et al., 2007; Perkonigg et al., 2000; Tolin, D.F., & Foa, E.B., 2006). In fact, estimates suggest that over 60% of all men will experience some type of traumatic event over their lifetime, while estimates for women are closer to 50% (Kessler et al., 1995; Veteran's Affairs, 2016). Furthermore, researchers indicate that cumulative trauma exposure, a lifetime history of experiencing multiple traumas, occurs at higher rates in men than it does women, a trend that some researchers have attributed to the fact that men appear to have greater variation in the types of traumatic events they experience in comparison to the variation among women (Breslau, 2009; Hatch & Dohrenwend, 2007).

Along with rates of exposure, the type of traumatic events most frequently experienced also differs by gender. Research suggests that throughout the lifespan, men are more likely than women to experience traumatic events such as non-sexual assault, serious accidents, combat, threat with a weapon, natural disasters and witnessing death or injury (Kessler et al., 1995; Kilpatrick, 2013; Norris et al., 2003; Perkonigg et al., 2000; Tolin & Foa, 2006). Women, however, are regularly found to be more at risk than men of experiencing violent interpersonal traumas, including sexual assault and rape (Breslau et al., 1997; Breslau et al., 1998; Kessler et al., 1995; Kilpatrick et al., 2013; Perkonigg & Wittchen, 1999, Kessler, 2017). While evidence

indicates that men experience traumas at higher frequencies than women, research suggests that that men are significantly less likely to develop PTSD than women (APA 2013; Breslau, 2009; Olff et al., 2007). In fact, the lifetime likelihood of developing PTSD is approximately two times higher for women than it is men (Breslau et al., 1994; Frans et al., 2005; Kessler et al., 1995; Olff & de Vries, 2004; Stein et al., 2000; Tolin and Foa, 2006).

As previously mentioned, men and women typically experience different types of trauma, which is consistently identified in research as an influential factor in this gender-based difference in PTSD development. Specifically, researchers have identified interpersonal traumatic events, traumas such as sexual assault and rape that are more commonly experienced by women, as increasing the susceptibility to PTSD development (Breslau & Anthony, 2007; Caramanica, Brackbill, Stellman, & Farfel, 2015; Fossion et al., 2015; Kessler et al., 2017; Olff et al., 2007). Research is mixed, however, with other studies implicating the presence of any type of violence in traumatic events as increasing the risk for subsequent PTSD development (Lowe, Walsh, Uddin, Galea, & Koenen, 2014; Smith, Summers, Dillon, & Cougle, 2016). While there are indeed gender specific differences in the experience of traumatic events and the development of PTSD, research shows that even as type and frequency of trauma exposure, preexisting mental health concerns, and reporting biases are accounted for, men are still less likely than women to develop PTSD following exposure to a traumatic event (Breslau, 2009; Gavrilovic, 2005; McLean & Anderson, 2009; Olff et al., 2007; Tolin & Foa, 2006). With these well researched variables held constant, extant literature indicates that men are developing PTSD at lower rates than women.

Relevant literature has varied with respect to the use of sex or gender in describing the differential experiences of trauma and PTSD between males and females, or between men and

women. Sex is defined as the biological characteristics of males and females and gender is defined as the complex set of societal norms and psychological constructs regarding how someone of that sex is expected to think, feel, and behave (Tolin & Foa, 2006; Lott & Maluso, 1993). The current study intends to examine the influence of socialized gender roles on the experience and interpretation of traumatic events and thus will utilize gender terminology and coding. While current psychological literature is more often framing gender as a construct that occurs on a continuum, extant research on sex and gender differences in PTSD is primarily focused on the differential experiences between the discrete gender categories of men and women. Given the paucity of holistic research and the aim to increase the understanding of how gender constructs facilitate responses to trauma exposure, the current study will examine experiential differences with respect to binary genders.

With this frame of reference in mind, it appears likely that the well-defined discrepancies in PTSD diagnoses between genders may be due to something beyond the type and frequencies of traumatic events or gender specific reporting biases. In fact, research on the cognitive processes underlying trauma responses and the development of PTSD regularly find gender-based differences in the perceptions of trauma and control, assessments of threat, and coping styles following trauma exposure (McLean & Anderson, 2009; Carver, Scheier, & Weintraub, 1989; Blake, Cook, & Keane, 1992). Men and women consistently endorse different patterns in their appraisals of threat and control, with men endorsing lower assessment of threat and lesser loss of control in comparison to women (McLean & Anderson, 2009). Following traumatic events, women are more likely than men to experience self-blame, negative cognitions of self and world, and are more likely to utilize emotion-based coping, which is less effective at reducing stress and has been connected to an increase in PTSD symptoms (Blake, Cook &

Keane, 1992; Carver, Scheier, & Weintraub, 1989; Tolin & Foa, 2002). Furthermore, women tend to report a lower self-efficacy in being able to cope with threats and lower confidence in problem-solving abilities when compared to men (Buchanon and Selmon, 2008; McLean and Anderson, 2009). Conversely, men are more likely than women to utilize active problem solving following traumatic exposures, which is implicated in healthy reductions of perceived stress levels (Carver, Scheier, & Weintraub, 1989). Gender differences in ruminative beliefs are also evident, with women more likely to believe that they are unable to adequately control negative emotions connected to potentially traumatic events (McLean & Anderson, 2009; Nolen-Hoeksema & Jackson, 2001).

These discrepancies in cognitive approaches suggest that there may be an inherent difference in the cognitive processes underlying how men and women assess and respond to traumatic events. Said another way, it is possible that prevalence discrepancies in PTSD symptom development are associated with socialized gender differences in the automatic, readily accessible cognitive tools that are available to make sense of traumatic exposure and respond to threats. This could mean that socialized learning of traditional gender norms and behaviors provides men a script for responding to traumatic events in a way that fosters more adaptive assessment of and coping with trauma, whereas traditionally feminine gender roles provide women a script that tends to foster less adaptive beliefs and behaviors that impede recovery from trauma

Theoretical Context

Discrepancies in responses to trauma suggest the possibility that the behaviors and response patterns connected to a more traditional socialized male gender role offer men a potentially advantageous perspective when faced with traumatic events that results in lower

endorsement of PTSD symptoms and diagnoses among men. Recent discussion on the functionality of socialized gender roles mirrors this possibility. O'Neil and colleagues (2017) as well as Addis et al. (2010) outline the need for a conceptual shift in how gender roles are approached and framed; a shift that moves away from considering gender roles as a potentially limiting internalization of societal pressures and expectations, and one that moves towards a more functional conceptualization that acknowledges the heuristic quality of gender roles; that they facilitate efficient and effective problem solving. From this perspective, social learning frames the development of gender roles and expectations regarding corresponding beliefs and behaviors. Contrary to many lines of contemporary gender role research, especially in the area of traditional masculinity, this learning may not be entirely detrimental or problematic (Addis et al., 2010).

Heuristics are the mental shortcuts that allow individuals to reduce the cognitive workload of assessing problems and predicting the efficacy of outcomes (Tversky & Kahneman, 1974). They afford the ability to act quickly in situations where snap decisions are paramount and where probabilities of actions are uncertain due to the inability to utilize logical theories to determine optimal solutions (Gigerenzer, 2008). Said another way, these mental shortcuts take the effort and attention out of decision making, often by applying learned experiences onto current problems. Research on the processes behind decision making describe heuristics as the "general problem-solving strategies" and "rule of thumb" guidelines that are applied to certain situations (Passer & Smith, 2004; Albar & Jetter, 2009).

Heuristics are often categorized into System 1 type thinking, the automatic and intuitive responses to environmental stimuli, instead of System 2, which is the effortful and logical thinking about probabilities and outcomes (O'Neil et al., 2017). Research suggests that the

controlled and intentional processing associated with system 2 thinking is disrupted by cognitive workload, whereas the automatic system 1 thinking is not (Sood & Brenner, 2007). This implies that system 1 thinking tends to take over in times where cognitive resources are limited. Trauma and stress are variables found to have a significant impact on cognitive functioning and resources. Traumatic stress negatively impacts performance on reasoning tasks and executive functioning (Klein & Barnes, 1994; Koso & Hansen, 2006). A possible explanation for this strain in cognitive resources and decreased functioning is related to trauma based intrusive thoughts and avoidance. Stress and trauma increase intrusive thinking, a symptom of PTSD, which in turn overloads cognitive resources (Boals & Banks, 2012). In the case of trauma exposure and post-traumatic recovery, heuristics would allow an individual to quickly and effortlessly assess perceived levels of threat and control and cope with the sequalae with minimal cognitive workload.

Recent writing has advocated for the exploration of the potential heuristic quality in the functionality of socialized gender roles (Wester, Heesacker, & Snowden, 2016). Little work has been done to understand how the subscription to learned gender roles might inform one's internal guidelines dictating how to automatically respond when the capacity for effortful System 2 thinking is not readily available (O'Neil, Wester, Heesacker, & Snowden, 2017). From this perspective, it is possible that socialized gender roles, and the behaviors that are learned to correspond with those gender roles and beliefs, might serve as heuristic shortcuts in problem solving and thus facilitate unique gender correlated perspectives in responding to stressors, evaluating outcomes, and coping with difficulties (O'Neil et al., 2017).

In fact, if one considers the discussed PTSD prevalence discrepancies in light of gender and heuristics, the pattern in trauma response makes sense. Evaluating and responding to a

traumatic exposure is an example of a situation where an individual would engage in System 1 thinking due to high stress and limited capacity for effortful cognitive work. In their assessment of the heuristic quality of gender roles, O'Neil and colleagues (p. 84-85, 2017) define the framework of gender heuristics as a "construal affecting how individuals perceive, comprehend, and interpret the world around them." The outlined research indicates that men and women draw from wide range of automatic beliefs and behaviors to interpret and respond to traumatic events, some of which might serve as a protective factor in the development of PTSD. This heuristics framework appears to capture the differences extant research implicates in the varied interpretations and responses men and women have during and following the exposure to traumatic events. Specifically, it seems that there may be components of traditionally masculine beliefs and behaviors that afford trauma survivors a unique and advantageous heuristic for perceiving and responding to traumatic events. In fact, this heuristic quality of traditionally male gender role subscription may act as a moderating variable, or a variable that strengthens or weakens the relationship between trauma exposure and PTSD, with extant research suggesting it may decrease the strength of this relationship.

In sum, research has consistently demonstrated that men and women experience different types of traumatic events and that the way in which they respond to those traumas often varies by gender. However, when the differences that are hypothesized to influence the development of PTSD are accounted for, women are still developing PTSD and endorsing PTSD symptoms at higher rates than men. It is important to identify what is influencing this discrepancy in diagnoses in order to better understand risk and protective factors in the development of PTSD. These differences suggest the possibility that learned, automatic problem-solving and response patterns associated with socialized gender roles, the heuristics of that gender role, influence how

individuals respond to trauma. To date, no study has directly examined the influence of male gender norms on the development of PTSD.

The goal of this study is to examine whether there is a heuristic quality to variables that correspond to traditionally masculine beliefs and behaviors and that are implicated in PTSD development. Furthermore, this study aims to determine if this heuristic influences the relationship between trauma exposure and the development of PTSD symptoms. In order to increase positive outcomes following traumatic events, we must first better understand the mechanisms that serve as risk and protective factors in the development of PTSD. The goal of this study is to determine if adherence to beliefs and behaviors associated with traditionally masculine gender roles serves as a protective factor in PTSD development and predicts lesser development of PTSD symptoms. More specifically, this study will test a model that fits a heuristic comprised of beliefs and behaviors correlated to a traditionally masculine gender role as a moderator between trauma exposure and PTSD development.

Moderator variables, or interaction variables, predict the strength or direction of a relationship between two variables. Said another way, they alter the strength of the relationship that already exists between two variables (Baron & Kenny, 1986; Kline, 2005). Mediator variables, another type of interaction variable, have an interaction effect value that explains the reason behind a pre-existing relationship between an independent and dependent variable (Kline, 2005). Complete mediation would indicate that the independent variable has an effect on the mediation variable, which in turn results in change on the dependent variable. Because there is a clearly identified relationship between trauma exposure and PTSD development, moderator terms and models are utilized in this study over mediator terms. Use of a mediated model in this study would indicate that subscription to masculine ideals and behaviors explains the reason the

relationship between trauma exposure and PTSD exists. Instead, the moderation model constructed in this study will examine whether subscription to a traditionally masculine heuristic style influences the strength of the relationship between trauma exposure and PTSD.

Research Questions and Hypotheses

Prior to data collection, and based upon relevant research, the following research questions and hypotheses are made.

1. Does a traditionally Masculine Heuristic style exist?
    a. Individuals will show patterns of endorsement on variables of interest that align with expected traditional male socialization. It will be expected, for example, that participants who endorse high self-reliance will also endorse active coping styles, as well as low threat perception, centrality of events, rumination, and negative cognitions. SEM will be used to construct a measurement model determining whether these proposed variables hang together in a way that is indicative of a latent construct (Masculine Heuristic).
2. What is the relationship between trauma exposure, a Masculine Heuristic, and development of PTSD symptoms?
    a. Endorsement of a heuristic style comprised of more traditionally masculine cognitions and behaviors will moderate the relationship between trauma exposure and PTSD symptom severity at a statistically significant level.
    b. Lower threat and negative appraisal patterns, endorsement of active coping styles, lesser rumination and centrality of events, and greater self-reliance, constructs that are more commonly associated with traditional masculinity, will decrease the

strength of the relationship between trauma exposure and PTSD symptom severity.

3. Is this moderation effect significant for both men and women?
    a. This moderation effect will be present regardless of gender (i.e. BOTH men and women who report adherence to this traditionally Masculine Heuristic will be less likely to develop PTSD following traumatic events).
4. Will type of trauma predict severity of PTSD symptoms?
    a. It is predicted that trauma directly experienced or witnessed by a participant, will lead to greater severity of PTSD symptoms when compared to trauma a person learned of in some way.

CHAPTER 2

Literature Review

Gender Socialization

Researchers and theorists often describe the learning and internalization of gender as a process that encompasses social, societal and cognitive theories. Under these frameworks, the learning of gender takes place throughout social interactions and daily activities and is internalized as children, and individuals of all ages, form cognitive representations of gender and what it means to be or act in congruence with that gender construct (Leaper & Friedman, 2007). Social interactions and indirect observations guide beliefs around gender-related behaviors and their consequences, a process that becomes more self-regulated as expectations and reinforcement grows (Leaper & Friedman, 2007; Bussey & Bandura, 1999).

While a full review of the mechanisms behind and variations of gender socialization is beyond the scope of the current study, the concept of socialized masculinity is a foundational aspect of the research questions at hand. The development of cognitive representations of gender guides one's interpretation of the world around them (Leaper & Friedman, 2007). Socialization of gender includes the development of personal preferences and identity, knowledge of and attitudes toward the gender of others, and traits, activities and roles that fit gender expectations (Leaper & Friedman, 2007; Liben & Bigler, 2002). The implicit and explicit messages regarding what it means to be male or female, the consequences of not conforming to expected gender guidelines, and the corresponding beliefs and behaviors all influence how an individual interprets, feels, and responds to a given situation. Gender roles thus shape responses to environment and can have an impact on a person's functioning in many ways. As an example, adherence to traditionally masculine beliefs and behaviors, including, but certainly not limited to,

emotional restriction, rigid self-reliance, and pursuit of status, is correlated to higher rates of depression, substance abuse, and negative attitudes toward seeking help (Gerdes & Levant, 2018). Gender socialization influences how men and women think, feel, and react, with much contemporary research focusing on traditionally masculine gender socialization predicts poorer outcomes for men.

Trauma and post-traumatic stress disorder

Epidemiological studies indicate that the majority of the population experiences some type of traumatic event over their lifetime (Benjet et al., 2016; Sledjeski et al., 2008; VA, 2013). However, only a small percentage of those individuals go on to develop posttraumatic stress disorder, with estimates around 8-10% (Atwoli, Stein, Koenen, & McLaughlin, 2015). Research consistently shows that men experience more traumatic events than women, while women are at greater risk of developing symptoms of posttraumatic stress disorder (APA, 2013; Breslau, 2009; Olff et al., 2007). Gender, type of trauma exposure, style of coping response, and appraisal of threat during trauma are all variables that have been implicated in the literature as influential in the development of PTSD following trauma exposure. To date, no study has directly examined how the gender-based socialization of these variables might afford individuals who adhere to more "masculine" traits and ideologies an advantageous approach in responding to traumatic events.

Post-traumatic stress disorder (PTSD) is an anxiety-based disorder resulting from exposure to a traumatic event. The most recent edition of the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-5*; American Psychiatric Association [APA], 2013) identifies 8 criteria for a PTSD diagnosis, the first of which is first-hand or indirect exposure to actual or threatened death, injury, or violence. At least one trauma related intrusion symptom, such as

distressing memories, dreams, or flashbacks and persistent avoidance of internal or external trauma related reminders must be present (APA, 2013). Symptom criteria also include negative alterations in thoughts and mood related to the trauma, as well as increased arousal and reactivity across at least two domains, such as increased startle response or irritability (APA, 2013). Duration and effect of these symptoms on functioning are also key criteria for PTSD diagnoses, as all of these symptom criteria must be present for at least 1 month, cause the individual significant distress, and not be attributable to any substances or medical conditions.

Rates of trauma exposure and PTSD

A number of epidemiological studies have outlined the prevalence of PTSD in the general population. Kessler and colleagues' (1995) National Comorbidity Study was the first nationally representative epidemiological survey on PTSD and resulted in one of the most cited articles describing lifetime prevalence rates for PTSD. Estimates from this study exposed the differential experiences men and women have regarding rates of trauma exposure and the development of PTSD symptoms. Findings indicated that men endorse a lifetime history of experiencing at least one traumatic event at greater rates than women, 60.7% of men compared to 51.2% of women, with men reporting histories physical assaults and violence more frequently, while women reported experiences of sexual violence more frequently (Kessler et al., 1995). According to this study, the estimate for lifetime prevalence of PTSD was 7.8% of the general population, and despite men experiencing trauma at higher rates, estimated risk for developing PTSD following trauma exposure was significantly higher for women (20.4%) than for men (8.1%) (Kessler et al., 1995). In sum, these findings indicate that trauma exposure is a rather common phenomenon in the general public, while developing PTSD after exposure to a traumatic event is relatively rare.

These results were replicated by Breslau and colleagues (1999) following the diagnostic changes for PTSD with the DSM-IV. This study used random digit dialing to select participants within a metropolitan area. A computer assisted telephone interview obtained data from participants and analyses were based upon a randomly selected trauma from each participant. Findings again indicated that lifetime prevalence of trauma exposure is lower in women than it is men, but that the risk of development PTSD following trauma exposure was two times greater among women (Breslau et al., 1999). This study also addressed the influence of trauma type on PTSD development, replicating Kessler and colleagues' (1995) findings that women develop PTSD at greater rates than men, even when type of trauma is accounted for (Breslau et al., 1999). The results did indicate that women experienced a greater risk of PTSD development following any type of assaultive violence, especially as they reported greater rates of avoidance and numbing symptoms than their male counterparts (Breslau et al., 1999). The authors indicate that these findings highlight the need to focus on sex differences in the response to trauma to identify possible explanations for the differences in avoidance and numbing following trauma exposure (Breslau et al., 1999).

The response rate for this study was relatively low (66.1%), but the authors reported that it was comparable to health-based telephone surveys and demographics of census data. While care was given in assessing the generalizability of the data, the authors were unable to identify predictors of non-response, indicating that there could be relevant data that is categorically absent. There are also concerns related to sampling quality as the authors randomly sampled telephone numbers in the Detroit metro. Current census estimates indicate that 36% of Detroit residents are currently in poverty, a rate that has been moderately stable in the past and that could be indicative of a disproportionate number of residents lacking telephone access (US Census,

2010). Furthermore, the prevalence rates were elevated in comparison to previously reported data (92.2% in men, 87.1% in women), but because this study used DSM-IV diagnostic criteria for trauma exposure which is more inclusive than the DSM-III, this difference was expected (Breslau et al., 1999).

To better understand the potential impact of the diagnostic revisions of the next edition of the DSM, Kilpatrick and colleagues (2013) were recruited to assess the prevalence of PTSD, according to the DSM-V criteria, within the general public. The results from this national study indicated that 89.7% of participants reported experiencing a traumatic event at some point in their life (Kilpatrick et al., 2013). Similar to other prevalence findings, lifetime estimates of PTSD in this sample ranged from 8.3%-9.4%, while estimates of PTSD in men were between 5.4-5.7% and women were 11.0-12.8% (Kilpatrick et al., 2013). The authors suggest that the increased estimates for composite, or multiple traumatic events, highlight the need for conceptualization of PTSD to recognize this as the norm as likelihood of PTSD development increases as event exposure increases (Kilpatrick et al., 2013). Limitations of trauma related studies often include sampling and recruitment methods, as random sampling for a trauma exposed population can be difficult and response rates are frequently low, both of which are evident in this study. Participants for the study included adults who chose to partake in online survey panels, a sample that increased response rates but is based on convenience of population and may exclude particular populations that don't have access to internet or would be unlikely to seek out such an opportunity. The authors did not identify any demographic gap related to who chose to partake in the survey compared to the general population. Although this does not provide a true national probability sample, it did produce a sample that is generally representative of the demographics of adults in the U.S. (Kilpatrick et al., 2013). The data from

this national study identified PTSD rates comparable to those already identified in previous epidemiological studies and indicates that changes in PTSD diagnostic criteria between the DSM-IV and DSM-V did not have a significant impact on prevalence rates, with women continuing to report greater likelihood of PTSD development in comparison to men (Kilpatrick et al., 2013).

Most research on PTSD, the aforementioned studies included, relies on participants perceptions and symptoms related to self-reported "worst" lifetime trauma, a tendency that Kessler and colleagues (2017) suggest might raise concerns of biases related to severity of trauma in estimating prevalence rates. In order to address this, researchers with the WHO World Mental Health survey generated a weighting scheme, wherein respondents are assessed for PTSD symptoms for worst trauma and for a randomly selected trauma (Kessler et al., 2017). This randomly selected trauma is weighted by the inverse of its probability to be selected at random among trauma types and combined with worst trauma to create a representative sample of trauma exposures in the general population (Kessler et al., 2017). Surveys measuring types of trauma exposure and PTSD symptoms were completed face-to-face in 24 countries (n = 68,894) using clustered area probability sampling of adult households. Similar to previous epidemiological studies, the majority of participants (70.4%) reported experiencing a lifetime trauma, with an average of 3.2 traumas per person and women found more likely to develop PTSD than men (Kessler et al., 2017). Results also indicated that women are more likely than men to experience intimate partner sexual violence (OR 2.3) and that the highest conditional risks for PTSD development are rape (19.0%), physical abuse by intimate partner (11.7%), kidnapping (11.0%), and other sexual assault (10.5%) (Kessler et al., 2017). Similar patterns emerged for the burden of PTSD, which identifies the length and severity of PTSD symptoms depending on type of

trauma in the population. As a whole, these results highlight that trauma exposure and burden varies, with interpersonal violence being associated with the greatest risk for PTSD development and burden, opening potential explanations for the gender differences in PTSD prevalence (Kessler et al., 2017). Therefore, the exploration of trauma specific variables is often turned to in order to better explain the gender discrepancies in PTSD rates.

Trauma-based variables

Prevalence studies focused on trauma and PTSD have consistently replicated the aforementioned findings that indicate women are at a greater risk than men of developing PTSD despite men experiencing trauma at greater rates (Breslau 2009; Frans et al., 2005; Olff & de Vries, 2004; Stein et al., 2000; Tolin & Foa, 2006). Several variables directly related to trauma have been identified as contributing to this discrepancy between men and women, including type of trauma and trauma history, both of which will be discussed at length.

Type of trauma

Among the variables implicated in the gender discrepancy between trauma exposure and PTSD rates, type of trauma exposure is frequently cited. The epidemiological study previously mentioned (Kilpatrick et al., 2013) highlights the discrepancies in type of trauma exposure by gender. Results indicated that instances of direct interpersonal violence, including physical abuse, aggravated assault, rape, and other sexual assault, was more commonly reported among women (58.6%) than men (47.1%) (Kilpatrick et al., 2013). Exposure to physical assault comprised 43.7% of the reported trauma history, with 44.9% of women and 42.4% of men, while sexual assault victimization was reported in 29.7% of individuals endorsing trauma exposure, 42.4% of those cases reported by women compared to 15.8% among men (Kilpatrick et al.,

2013). Prevalence rates that women are more likely to experience interpersonal traumas than men and more likely to experience sexual assaults than men.

To directly assess the role type of trauma has in PTSD development, researchers classified traumatic events into the categories of sexual trauma, nonsexual assaultive trauma and nonassaultive trauma in a sample of Canadian participants (Stein et al., 2000). Women were found to be at a higher risk than men for developing posttraumatic stress disorder following nonsexual assaultive traumas, but not following nonassaultive traumas. The authors suggest that a larger sample size than provided by their study may have been necessary to detect a gender difference in the nonassaultive trauma category and do not conclude that women are more susceptible to posttraumatic stress disorder following assaultive traumas. However, there is evidence that the gender difference in posttraumatic stress disorder is more evident following violent interpersonal traumas. For example, female adolescents who are exposed to violent traumas have been found to be up to six times more likely to develop posttraumatic stress disorder than male adolescents (Breslau, Davis, Andreski, & Peterson. 1991; Giaconia et al.,1995).

A longitudinal study following 715 participants who were hospitalized following an interpersonal or noninterpersonal trauma sought to determine the differential impact of trauma type (Forbes et al., 2012). PTSD symptom profiles for each participant were assessed using the Clinician-Administered PTSD Scale at 3-, 12-, and 24-months following hospitalization. The authors identified significant differences between the interpersonal and noninterpersonal trauma groups in PTSD symptom severity at each follow-up point (3 months, $F_{17,696} = 5.86$, $P < .001$; 12 months, $F_{17,696} = 3.62$, $P < .001$; 24 months, $F_{17,696} = 3.09$, $P < .001$) (Forbes et al., 2012). The survivors of interpersonal traumas endorsed significantly higher scores on 14 of the PTSD

symptoms measured at three months and 6 of the PTSD symptoms at 24 months ($p < .01$), with consistent differences in symptoms related to fear and threat (Forbes et al., 2012). These findings indicate that interpersonal traumas put individuals at greater risk for developing PTSD in comparison to noninterpersonal traumas such as a car accident.

In a similar, but cross-sectional study, Forbes and colleagues (2014) used existing data from the 2007 Australian National Survey of Mental Health and Well-Being. The researchers examined the differential PTSD symptom experience for 1,012 individuals who endorsed experiencing noninterpersonal traumas, nonintimate interpersonal traumas, and intimate interpersonal traumas (Forbes et al., 2014). The authors found that survivors or intimate interpersonal traumas were significantly more likely to experience symptoms that map onto core PTSD diagnostic criteria, including intrusive reexperiencing, avoidance of reminders, hypervigilance, and startle responses than survivors of noninterpersonal traumas (Forbes et al., 2014). They were also significantly more likely to report distress from trauma reminders, avoiding thoughts about the trauma, endorse feelings of detachment and restricted affect than the noninterpersonal trauma survivors (Forbes et al., 2014). Forbes and colleagues (2014) identify the experience of intimate interpersonal trauma as contributing to greater intrusive symptoms and emotional detachment and suggest that interpersonal traumas as a whole contribute to individuals perceiving their environments as unsafe and unpredictable which may explain greater PTSD symptom risks.

Lowe and colleagues (2014) sought to better understand the roles of type of trauma (assaultive and nonassaultive) and trauma histories in the development of PTSD. They identified assaultive trauma as the "actual or threatened violations of bodily integrity that are interpersonal in nature" and nonassaultive trauma as "actual or threatened violations of bodily integrity that are

not inherently interpersonal in nature" with both categories of trauma including direct and indirect exposure (Lowe et al., 2014). The authors used a longitudinal, cross-lagged design with data drawn from the longitudinal Detroit Neighborhood Health Study (DNHS), which interviewed a predominantly non-Hispanic Black adult sample (N=1360) in the Detroit metro in three waves, each approximately a year apart (Lowe et a., 2014). Results indicate that for participants who experienced assaultive trauma, more traumatic events at Wave 2 reporting was associated with significantly higher post-traumatic stress at Wave 3 reporting (Lowe et al., 2014). In contrast, with respondents reporting history of nonassaultive trauma, greater levels of post-traumatic stress at Wave 1 and Wave 2 was associated with a greater number of nonassaultive events at the following Wave (Lowe et al., 2014). Assaultive trauma was associated with higher levels of post-traumatic stress while higher levels of post-traumatic stress was associated with increased traumatic events. Lowe and colleagues (2014) suggest that these results are indicative of a cycle of trauma wherein assaultive trauma history increases risk for post-traumatic stress which then increases the risk for exposure to nonassaultive trauma. Said another way, the exposure to lifetime traumatic events of any kind increase the risk for greater levels of post-traumatic stress and even heightened risk of exposure to further traumas (Lowe et a., 2014).

While their study utilized an urban sample with a wide range of data points, Lowe and colleagues (2014) lacked depth of information due to pulling historical data. The authors utilized random phone sampling and random selection within a household, but it is possible that this was inadequate in procuring a representative sample. Similarly, all participants in the study lived in Detroit, which could lead to concerns regarding whether a high poverty, urban environment might inflate the data. Finally, the authors were unable to fit their data to a model that

incorporated both assaultive and nonassaultive trauma together, so were unable to directly assess the cycle of trauma adversity of the indirect paths between assaultive to nonassaultive events and post-traumatic stress.

Breslau (2009) further examined the data from the 1996 Detroit Area Survey of Trauma (Breslau et al., 1998) to tease apart the sex differences in trauma and PTSD, including a look at the conditional risk, or the likelihood of developing PTSD following trauma exposure. The conditional risk for PTSD development following any type of trauma exposure was 13.0% in females and 6.2% in males ($p < .001$), a difference that the author attributes to female's greater conditional risk following assaultive violence in comparison to men (35.7% and 6.0% respectively) (Breslau, 2009). These results indicate that when accounting for the type of trauma experienced, female trauma survivors are still at a greater risk than their male counterparts for developing PTSD following exposure. Due to examining previously gathered data, the author was unable to make any assertions regarding the potential causes of this conditional risk difference. However, Breslau (2009) does explicitly find that PTSD risk differences are not due to the higher occurrence of sexual assault among females, prior traumatic experiences, preexisting depression or anxiety disorder, or sex-related bias in reporting.

Similarly, the National Comorbidity Survey-Replication (NCS-R) study acquired a nationally representative sample of the U.S. for prevalence studies of mental health. The NCS-R identified nearly 10,000 adult participants via multi-stage clustered area probability to complete face-to-face interviews, 398 of whom met diagnostic criteria for lifetime presence of PTSD (Smith, Summers, Dillon, & Cougle, 2016). Researchers assessed for worst-event trauma in order to determine how the type of trauma experienced influenced PTSD development, with the most frequently reported worst-events including non-sexual physical violence ($n = 55$), sexual

trauma (n = 87), and unexpected death of a loved one (n = 87) (Smith et al., 2016). Sexual traumas and non-sexual physical violence were both associated with greater severity and duration of PTSD symptoms than other worst-event trauma types, supporting the hypothesis that type of trauma has a direct impact on PTSD symptoms and that interpersonal traumas appear to have the strongest predictive effect.

In their meta-analysis of 290 independent studies Tolin and Foa (2006) confirmed that male respondents were more likely than their female counterparts to endorse a history of trauma exposure, while female respondents were more likely to meet criteria for PTSD. Traumas that were more common among men included experiencing accidents, nonsexual assault, combat or war, disaster or fire, or serious illness or unspecified injury and witnessing death or injury, while female respondents are more likely than male participants to endorse history of sexual assault and child sexual abuse (Tolin & Foa, 2006). However, the authors were unable to confirm that type of trauma experienced was a primary explanation of sex differences in PTSD rates. Within the same categories of trauma type, including childhood sexual abuse and adult sexual assault, female participants were still more likely to meet criteria for PTSD and endorsed greater severity of PTSD symptoms than male participants. (Tolin & Foa, 2006). Interestingly, in traumas more commonly endorsed by men, such as combat, non-sexual assault, and accidents, the greater likelihood for women to endorse PTSD was consistent (Tolin & Foa, 2006). These findings indicate that when type of trauma is held constant, females have a greater risk of developing PTSD than do males. Tolin and Foa (2006) identify the need for further research to parse out the potential resilience or vulnerability factor sex might have on PTSD development. On a methodological note, the identification of sex difference was dependent upon type of sample and study used. Tolin and Foa (2006) reported that these differences were less pronounced in

convenience samples and questionnaire-based studies than in epidemiological studies using structured interviews.

These results have been replicated across studies in recent research. While the rates vary somewhat study to study, men are consistently less likely that women to develop PTSD, even after experiencing the same type of traumatic event (Norris et al., 2003; Perkonigg et al., 2000). Research shows that interpersonal traumas are significantly more likely to lead to PTSD development compared to other types of traumatic events, and also indicates that women are more likely than men to experience interpersonal traumas (Breslau & Anthony, 2007). However, researchers have controlled for trauma type and determined that following an interpersonal assault, women are still significantly more likely to develop PTSD than men (Breslau, 2002), In fact, a study directly assessing the gender differences in PTSD identified PTSD probability rates of 36% and 6% for women and men respectively following an interpersonal assault (Breslau, 2002

History of trauma exposure

Research also points to a cumulative trauma exposure, or the experience of multiple traumatic events across a lifespan, as a potential risk factor in developing PTSD. Breslau and colleagues (2008) utilized a cohort study design to assess the prospective likelihood for PTSD development among 990 randomly selected participants between 21-30 years of age. Baseline data was assessed in 1989, with 3-, 5-, and 10-year follow ups (Breslau et al., 2008). Data from the baseline was compared to the 3- and 5-year follow-up period (combined to stabilize data), and then from the combined 5-year dataset to the 10-year follow up using multinomial logistic regression with generalized estimating equations (Breslau et al., 2008). Results indicated that the estimated risk of PTSD from trauma exposures in the follow-up periods was 3 times greater

among the participants that had prior PTSD when compared to those without prior PTSD (odds ratio, 3.01, 95% CI) (Breslau et al., 2008). Breslau and colleagues (2008) found no such elevation in participants with history of trauma exposure but absent PTSD symptoms. These results held even as the authors controlled for variables including sex, race, education, and preexisting mental health concerns (Breslau et al., 2008). Interestingly, the authors also looked at the effect of trauma exposure and PTSD on subsequent trauma exposure and found that prior trauma exposure, with or without PTSD development, was associated with increased risks of subsequent trauma exposure (Breslau et al., 2008). These findings suggest that without assessing for prior PTSD, studies of observed differences in PTSD rates and experiences might not have a comprehensive understanding of contributors to PTSD development. Using a prospective, longitudinal design, authors in this study also avoided possible biases that can occur in retrospective studies.

Similarly, Caramanica and colleagues assessed the impact of compound trauma exposure among 4,137 participants living in the New York tri-state area (Caramanica et al., 2015). Participants for the study were randomly sampled from the World Trade Center Health Registry, which afforded researchers a study sample that had experienced both the traumatic events of the 9/11 terrorist attack in New York City and Hurricane Sandy in 2012 (Caramanica et al., 2015). Participants were divided between two groups, those in FEMA-designated inundated zones that were overwhelmed by the hurricane and those in non-inundated zones. The results from this study showed that rates of PTSD following Hurricane Sandy were 28.8% higher among participants who lived in inundated zones who had a history of 9/11 related PTSD (Caramanica et al., 2015). Participants who experienced traumatic life events following 9/11 or multiple trauma exposures related to 9/11 also had greater rates of PTSD following Hurricane Sandy,

19.7% and 12.9% respectively (Caraminca et al., 2015). Using adjusted odds ratios, the authors suggest that Hurricane Sandy related PTSD was 7 times greater among participants with 9/11 PTSD history (AOR=6.6, 95% CI: 4.6–9.6), but highlight that this effect is only found with endorsement of PTSD history as similar results were not found for those exposure to 9/11 traumas but absent PTSD symptoms (Caramanica et al., 2015). Participants in this study were more likely than non-participants to be females with higher levels of 9/11 exposure, which raises a possible concern for reporting biases. It is possible that gender biases, significance of the exposure related to a terrorist attack, or priming from 3 waves of surveys measuring PTSD responses could have had an influence on response styles among this sample.

To determine the role of revictimization in PTSD among women with a history of sexual assault, researchers pulled existing data from three nationally representative samples of adolescent, college, and house residing females. Samples were determined via random digit dialing and modified to reflect the U.S. population, with a final sample size of 6,764 females who completed surveys regarding sexual trauma history and PTSD symptoms (Walsh et al., 2012). Of those with a history of sexual victimization, approximately 50% of each group (53% of adolescents, 50% of college women, and 58.8% of household-residing) reported revictimization (Walsh et al., 2012). Participants who endorsed a single victimization were 2.4 to 3.5 times more likely to meet PTSD criteria in the past 6 months than nonvictims, while participants who endorsed a history of multiple victimizations were 4.3 to 8.2 times more likely to meet PTSD criteria in the past 6 months than nonvictims (Walsh et al., 2012). Because assaults and PTSD symptoms were measured by classifications rather than continuous variables, no observations could be made regarding the incremental influence of greater number of traumas or severity of symptoms.

Individual Variables in PTSD development

A number of individual variables regarding the interpretation of and response to trauma have also been implicated in the relationship between trauma exposure and PTSD development. Researchers have identified negative cognitions, centrality of events, threat perception, and coping responses as key components in predicting whether or not an individual exposed to a traumatic event develops PTSD. Each of these variables will be discussed further in the following sections.

Negative cognitions

Most theories of trauma and post-trauma responses suggest that exposure to a traumatic event alters the survivor's thought patterns in a way that can facilitate PTSD, specifically negative changes in thoughts about the self and about the world (Ehlers & Clark, 2000; Foa & Rothbaum, 1995). As explained by Foa and Rothbaum (1995), many individuals hold generalized beliefs about themselves and the world prior to experiencing a traumatic event. These beliefs can imply that the world is safe and that the person is competent, which can make assimilating the traumatic experience into that belief system challenging and can lead to an overreliance on the prior beliefs, or they can imply that the world is unsafe and the person is incompetent, in which case traumatic exposures can reinforce and strengthen that belief pattern (Foa & Rothbaum, 1995). Regardless of the direction in these beliefs, Foa and Rothbaum (1995) suggest that the very presence of a rigid perspective of self and world makes an individual more vulnerable to PTSD development, as the rigidity of this belief system impairs a person's ability to discriminate levels of competence and safety and to understand their trauma as one unique event without broader implications.

In order to organize and understand the impact of these rigid belief systems and the role they have in PTSD development and persistence, Foa and colleagues (1999) sought to develop a comprehensive measure of cognitions related to trauma and trauma sequalae. Based on extant theories regarding post-trauma responses and clinical interviews, the researchers created a scale of one hundred and fourteen items outlining negative cognitions commonly associated with trauma responses, which was then reviewed by six experts in the field of PTSD (Foa et al., 1999). The resulting scale, the Posttraumatic Cognitions Inventory (PTCI), was subsequently administered to 601 participants, with 392 of these participants endorsing exposure to a traumatic event and 170 of these participants meeting diagnostic criteria for PTSD (Foa et al., 1999). Factor analysis was performed on only the traumatized portion of the sample, with principal-components analysis yielding 3 distinct factors loading onto the PTCI: Negative Cognitions About Self, Negative Cognitions About the World, and Self-Blame (Foa et al., 1999). Results indicated that the PTCI showed good internal consistency and reliability as well as convergent and discriminant validity (Foa et al., 1999). Most importantly, the PTCI identified 3 distinct cognitive factors that allowed researchers to differentiate between traumatized participants with and without PTSD, indicating that alterations in these thought patterns are highly correlated with PTSD development. Endorsement of negative cognitions patterns that are related to a distorted view of the trauma and its impact on an individual's life and functioning is directly connected to an increased vulnerability to PTSD symptom development and greater intensity of symptoms.

In a similar attempt to understand the role of cognitive factors in the development and maintenance of PTSD, Dunmore, Clark and Ehlers (1999) interviewed 57 survivors of physical and sexual assault as part of a prospective study. Items addressed in the semi-structured interview included severity of assault and cognitive factors presumed to influence PTSD.

Participant's responses were measured within 4 months of the initial assault, and again at 6- and 9-month follow-ups (Dunmore et al., 1999). The authors identified several cognitive variables as statistically significant predictors of PTSD including cognitive processing style during the assault (i.e. mental defeat, mental confusion, detachment); appraisal of assault consequences (i.e. appraisal of symptoms, perceived negative responses of others, permanent change); negative beliefs about self and world; and maladaptive control strategies (avoidance/safety seeking) (Dunmore et al., 1999). Furthermore, even when controlling for gender and assault severity, the relationships between processing and appraisal styles, control strategies, and PTSD symptomology remained statistically significant (Dunmore et al., 1999). The authors note that these cognitive variables facilitated both the onset and maintenance of PTSD, while other implicated variables, including dissociation during the assault, predicted only the onset of PTSD (Dunmore et al., 1999). Common with PTSD studies, the authors cite the retrospective design of the study as a limitation, suggesting that individuals may not have accurate recollections of their response to traumas (Dunmore et al., 1999). The majority of trauma and PTSD studies, however, are retrospective in nature as identifying and maintaining adequate response rates among a recently traumatized population can pose recruitment challenges. Furthermore, the response patterns identified in this study have been replicated and fit the hypothesized theoretical models of PTSD development.

Building upon these findings, Ehlers and Clark (2000) created a cognitive model of PTSD that identifies cognitive appraisal as a key component in the development and maintenance of PTSD. The authors identify two specific cognitive processes, appraisal of the trauma and/or its consequences and disorganization of the memory and understanding of the event, as facilitating a sense of current threat and thus contributing to PTSD symptoms (Ehlers &

Clark, 2000). It is hypothesized that the perceived threat facilitates behavioral and cognitive responses that may lead to short-term reduction in stress and threat levels but actually maintain symptoms in the long run (Ehlers & Clark, 2000). The appraisal of the trauma and consequences are sweeping negative generalizations that preclude individuals from viewing their trauma as a time-limited event without future consequences. These appraisals are frequently negative views of internal and external experiences, such as the fact that the trauma happened (e.g., "Nowhere is safe"), that it happened to the individual (e.g., "I attract disaster"), response during trauma (e.g., "I deserve bad things"), initial PTSD symptoms (e.g., "I'm going mad, I will never recover"), reactions from others (e.g., "They think I am too weak"), and other consequences of the trauma (e.g., "My marriage is over, my body is ruined") (Ehlers & Clark, 2000). Ehlers and Clark (2000) identify a twofold effect of these appraisals, specifically that they directly produce negative emotions and also facilitate dysfunctional coping strategies that paradoxically increase and maintain PTSD symptoms. Said another way, negative appraisals of the trauma and its impact increase emotional dysregulation and lead to coping mechanisms that maintain anxiety and fear responses thus maintaining PTSD symptoms. Ehlers and Clark's cognitive model of PTSD has been the basis for much of the recent research on the effect of cognitive appraisal style on PTSD development and maintenance.

The key role and predictive quality of cognitive appraisal styles has held consistently in further research and in longitudinal studies. O'Donnell and colleagues (2007) sought to include cognitive appraisals immediately following trauma exposure to adequately assess the impact of thought patterns across the course of PTSD development. In a longitudinal study of individuals hospitalized for injuries, 253 participants completed the Posttraumatic Cognitions Inventory (PTCI) and Clinician-Administered PTSD Scale for DSM-IV (CAPS) to assess appraisal styles

and PTSD symptom severity within 1 week of trauma exposure (acute), and at 3-month, and 12-month follow ups (O'Donnell et al., 2007). Path analyses indicated that acute negative cognitions, specifically negative views of self and self-blame, were statistically significant predictors of PTSD symptoms at 3 months and even accounted for more variability in PTSD symptoms at 3 months than did acute PTSD symptoms (O'Donnell et al., 2007). Furthermore, negative cognitions were also statistically significant predictors of PTSD symptoms at 12 months, with negative thoughts about the world accounting for the most variability (O'Donnell et al., 2007). Of note, this study found that higher levels of self-blame predicted a decrease in PTSD symptomology, which is in direct opposition with seminal research indicating that higher levels of self-blame and negative self-appraisals facilitate PTSD symptoms (Foa et al., 1999). However, the sample from this study followed injury survivors, most of which occurred from motor vehicle accidents, indicating that self-blame and perception of control may serve a differential function when controlling for the type of trauma exposure (O'Donnell et al., 2007). Overall, these results indicate that negative self-appraisals facilitate an internally derived sense of danger that is a powerful force in the development and maintenance of PTSD (O'Donnell et al., 2007). A possible explanation for this is given by Foa and Rothbaum (1998) in the suggestion that a trauma survivor's beliefs about the world and about the self interact in such a way that the world becomes more dangerous when individuals perceive themselves to be incompetent in some way.

Gender differences have also been noted in negative beliefs following trauma exposure. Ries and colleagues (2016) sampled 674 participants, 434 of whom were university students without a current psychiatric diagnosis, 127 of whom were psychiatric patients diagnosed with psychiatric disorders, and 113 of whom experienced an environmental disaster (Ries et al.,

2016). Using the Davisdon Trauma Scale and its recommended PTSD symptom cutoffs, researchers divided participants into two groups: those with and without PTSD symptoms (Ries et al., 2016). Results indicated that 39.3% of the women and 42.5% of the men in the sample met PTSD symptom criteria, which was not a statistically significant difference. Using the PTCI, 18.6% of the participants did not endorse posttraumatic beliefs, 71.7% of the participants endorsed posttraumatic beliefs without meeting the criteria for PTSD, and 9.7% of the participants endorsed posttraumatic beliefs with symptoms of PTSD (Ries et al., 2016). Comparing these results by gender, 52.21% of women experienced post-traumatic beliefs compared to 38.05% of men (Ries et al., 2016). Again, while a difference was identified by gender, it was not found to be statistically significant ($t = 1.013$; $p = 0.86$; $d = 0.19$). The intent of this study was to identify the interactive role between posttraumatic beliefs and pathological personality traits in PTSD development, so the described results regarding gender differences in posttraumatic beliefs were not the primary focus of the study and there were no exclusion criteria with a large number of participants endorsing comorbid diagnoses, including substance use, mood, and psychotic disorders as well as a range of disordered personality traits (Ries et al., 2016). This is in contrast with the strict exclusion criteria that are often present in PTSD research to minimize conflation with other symptom profiles. Thus, while no significant mean differences were found between genders, the results of this study do identify a higher prevalence of posttraumatic negative beliefs in women, a result that warrants further exploration.

To directly assess the comparative differences in posttraumatic cognitions between men and women, researchers interviewed 90 participants (53 men, 37 women) being treated for nonsexual trauma incidents in Romanian primary care facilities (Herta et al., 2017). The PTCI and the Short Post-Traumatic Stress Disorder Rating Interview (SPRINT) were used to measure

posttraumatic cognitions and PTSD symptoms respectively (Herta et al., 2017). Results indicated that impact of accidental traumas impact PTSD symptom development by gender, as women with a permanent disability from their trauma scored significantly higher on the SPRINT measure than male participants ($p = .049$, Mann-Whitney U) (Herta et al., 2017) More importantly, however, are findings confirming the presence of different experiences regarding posttraumatic cognitions by gender. Results show that women who endorsed clinically significant PTSD symptoms experienced significantly more negative cognitions related to the instrumentality of their trauma, strength, and control than their male counterparts (Herta et al., 2017). Results shifted when trauma led to a long-lasting injury, wherein women with a permanent disability endorsed fewer negative cognitions related to emotionality, dependence, and low self-efficacy than the male participants with a permanent disability (Herta et al., 2017). With more time elapsed since trauma exposure, men reported a decrease in self-efficacy, problem solving, and emotional than their female counterparts (Herta et al., 2017). In sum, the findings of this study show that negative cognitions certainly play a key role in PTSD development and likely have a complex relationship with gender. The intensity of symptoms and presence of disability following trauma appear to interact with gender, as women with significant PTSD symptoms endorse more negative cognitions than their male counterparts, yet those with permanent disability from their trauma endorse fewer negative cognitions than their male counterparts (Herta et al., 2017). However, the pattern of negative thoughts is important to consider, as the negative cognitions endorsed at a higher rate by men with a permanent disability included those related to emotionality, dependence, and low self-efficacy, which could be connected to the male participant's experience of the disability rather than the trauma. It is also

worth noting that limiting participants to only those experiencing accidental, non-interpersonal traumas may elicit different cognitive processes than interpersonal traumas.

Centrality of Events

The second component of Ehlers and Clark's (2000) model of PTSD development implicates the integration of the trauma memory as an important component. Critiques of Ehlers and Clark's model have arisen, however, as research into the memory component have yielded results that conflict with some aspects of the original model. Ehlers and Clark's hypothesized model indicates that trauma memories are disjointed and disorganized which can prevent the survivor from fully processing and adequately integrating the trauma into their memory and identity (Ehlers & Clark, 2000). However, research into the effect of memory integration has determined that the opposite is more accurate. In a cross-sectional survey of 181 Danish college and high school students, 113 of the participants endorsed experiencing at least one traumatic event during their lives (Berntsen et al., 2003). Multiple regression analyses indicate that participants who endorsed PTSD symptoms were significantly more likely to see connections and similarities between their traumas and their current life experiences ($t = 5.5$, $p < .001$) and significantly more likely to report that their trauma had become part of their identity ($t = 2.36$, $p < .05$) than the participants who did not endorse PTSD symptoms (Berntsen et al., 2003). While participants in this study endorsed varied types of traumatic events, researchers failed to identify a difference between PTSD and non-PTSD groups with respect to type and severity of trauma, which is incongruent with extant research on the role of trauma type on PTSD development. Even so, the results indicate that the overidentification with the traumatic event could also interfere with the healthy understanding and integration of trauma, which implicates the variable

of event centrality, or the degree to which traumatic events are believed to integral to a person's life and identity.

To examine the function of this overintegration of trauma, Lancaster and colleagues (2011) tested a cognitive model assessing the relationships between event centrality and posttraumatic cognitions. The sample for this study comprised 514 midwestern undergraduate students who endorsed experiencing at least one traumatic event. Path analyses tested several models of relationships between participants' posttraumatic cognitions and the centrality of the traumatic event to the sense of self and how they might predict current severity of PTSD symptoms, including how centrality of events might mediate post-traumatic cognitions and vice versa (Lancaster et al., 2011). Results suggest that both event centrality and posttraumatic cognitions are unique and independent predictors of PTSD symptomology development (Lancaster et al., 2011). These findings confirmed that appraisals of self and event centrality, as outlined in the cognitive model of PTSD, were strongly associated with severity of PTSD symptoms. They further suggest that highly integrated trauma memories, not necessarily poorly integrated trauma memories, may increase symptom severity. However, the current study suggests that overly integrated trauma memories may lead to greater distress and PTSD symptom development, not poorly integrated memories as suggested by Ehlers and Clark. Of note, significant differences were found between men and women on ratings of the Blame subscale of the PTCI (r=.146) and the total CES score (r=.331) but the authors warn that the number of comparisons required to examine possible gender differences may inflate error (Lancaster et al., 2011). Overall, these findings suggest that the suggested function of memory integration proposed by Ehlers and Clark (2000) may not adequately capture symptom progression as it is

likely the overidentification with trauma memories that is predicting PTSD development alongside previously identified negative posttraumatic cognitions.

In an attempt to integrate extant literature on the role of event centrality with the influence of cognitive appraisals, Barton and colleagues (2013) looked at the roles of event centrality and posttraumatic cognitions in college and treatment-seeking samples. Participants, including 500 undergraduate psychology students and 53 females accessing community services for physical and sexual abuse, identified primary trauma exposures and completed several brief surveys (Barton et al., 2013). Hierarchical regression analyses in both studies indicated that posttraumatic cognitions and event centrality significantly predicted PTSD in the undergraduate ($R^2 = .46$) and treatment-seeking samples ($R^2 = .46$) (Barton et al., 2013). An interaction effect between variables was found in the undergraduate sample only, wherein the severity of PTSD symptoms increased with higher scoring of event centrality and posttraumatic cognitions (Barton et al., 2013). The presence of the interaction in the undergraduate sample only could be indicative of the smaller sample size for treatment-seeking participants as well as differences in the reporting of event centrality, as treatment-seeking participants scored their traumatic exposures as less central to their identity than did the undergraduate participants. The authors were also interested in the impact of event centrality and posttraumatic cognitions on posttraumatic growth (PTG), with findings indicating that high event centrality has a positive predictive effect on PTSD and PTG while negative cognitions predicted increased PTSD and decreased PTG (Barton et al., 2013). These findings seem to highlight the key role of negative posttraumatic cognitions in the progression of PTSD symptoms. They also point to the fact that lower levels of negative cognitions following trauma exposure may facilitate more positive psychological adjustment.

Similar to those identified in negative cognitions, gender-based differences are evident in the endorsement of event centrality. In order to examine this, Boals (2010) conducted two separate studies to assess potential differences in the extent to which male and female participants identify negative and positive events as central to their identity. One hundred and seventy participants (98 women, 72 men) from Duke University received course credit for completing a series of surveys that assessed the characteristics and impacts of self-reported positive and negative events (Boals, 2010). Results from the first study indicated that female participants endorsed significantly higher levels of event centrality for negative events than did male participants ($t = 2.19$, $p < .05$) (Boals, 2010). Additionally, higher levels of event centrality were also correlated to higher ratings of reliving the event, negative emotions, and emotional intensity, all of which are related to clusters of PTSD symptoms ($r = .26$, $p < .001$; $r = .17$, $p < .05$; $r = .33$, $p < .001$) (Boals, 2010). Thus, the hypothesis that higher event centrality scores would correlate to higher PTSD scores was confirmed ($r = .37$, $p <.001$) (Boals, 2010). In study two, the researchers used the 2004 presidential election as the key event to control for potential confounds in the type of reported events. Using 2 (gender) x 2 (candidate voted for) ANOVA and stepwise regression analyses, researchers to determined that gender ($F = 5.30$, $p < .05$; $F = 5.23$, $p < .05$) and voting preference ($F = 4.91$, $p < .05$; $F = 5.30$, $p < .05$) remained significant ($R^2 = .15$), indicating that female participants and participants that voted for Kerry, and thus viewed the event as more negative, endorsed higher levels of event centrality (Boals, 2010). Researchers reported that a computer error resulted in the loss of the description of 24 participant's nominated event, while most described events (loss of a relationship, academic/athletic failure) would not warrant inclusion for recent studies on the development of PTSD. However, the results replicated previous studies' findings that higher scores of event

centrality correlate to higher PTSD symptomology and thus likely identifies patterns that also exist in traumatized populations. Boals (2010) suggests that these results show how the gendered socialization of women's relationships with emotions, and therefore also men's distinct relationships with emotions, construct a map of how a particular gender learns to identify, interpret, and react to complex events.

Threat appraisal

Researchers have identified subjective interpretations, such as the degree to which an individual believes experienced traumas were unpredictable, uncontrollable, or overwhelming as another risk factor in the development of PTSD, and one that frequently differs by gender (Cohen et al., 1983). Many of these subjective characteristics and appraisals of traumatic events have proven to be stronger predictors of PTSD than objective characteristics of the event (Ozer et al., 2003). After accounting for objective trauma characteristics such as trauma type and history of trauma exposure and mental health diagnoses, the subjective appraisals of traumas, including perceptions of loss, threat, and controllability, often explain much of the difference in rates of PTSD risk and development (Olff et al., 2005). Researchers have suggested that the influence of subjective appraisals of threat and impact of trauma likely explain the divergence of PTSD among those who develop PTSD after stressful but noncatastrophic events, and those who do not develop PTSD after objectively catastrophic events (Olff et al., 2005; McNally, 2003). Research has consistently implicated perceived threat as a key contributor to PTSD symptoms, as greater levels of perceived loss and threat, along with lower levels of perceived controllability have been connected with higher levels of PTSD symptoms and diagnosis (Norris et al., 2002; Ozer et al., 2003).

Researchers sought to identify which psychosocial variables, including perceived threat, control, social support, and coping styles might predict PTSD symptoms following motor vehicle accidents (Dougall et al., 2001). Individuals who were admitted to an Atlantic metro trauma center or emergency room following a motor vehicle accident were sampled with 115 participants completing all 4 survey periods, the first 2 to 3 weeks following discharge from the hospital and then again at 3, 6, and 12 months after the accident (Dougall et al., 2001). Logistic regression analyses and discriminant function analyses were used to assess the predictive qualities of each variable. At 1-month post-accident, the presence or absence of PTSD symptoms was predicted by participant's gender, as well as by injury severity and perceived threat (Dougall et al., 2001). Gender of the participant was statistically significantly in distinguishing between the symptom presence or absence at 1 month, (X^2 (1,82) = 6.58, $p < .01$). Results at 12 months indicated that the group endorsing sustained PTSD symptoms reported higher perceived threat (mean = 2.82, SD = 1.37) than the group without PTSD symptoms (mean = 1.21, SD = 0.27) ($F(2,58) = 3.79$, $p < .05$) (Dougall et al., 2001). As a group, participants who recovered, or endorsed a subthreshold decrease in PTSD symptoms by 12 months post-accident, did not differ in threat perception from the sustained or symptom free groups (mean = 2.05, SD = 1.31) (Dougall et al., 2001). The results from this study replicated gender differences in PTSD development with female gender serving as a significant predictor at each time period and clearly implicate threat perception as a predictor of the onset and persistence of PTSD symptoms. However, at each assessment period, the variables were added to the predictive analyses models as groups, which limits the ability to identify the unique contribution for each variable.

Ozer and colleagues (2003) reviewed 476 eligible PTSD studies, identifying 68 published empirical studies assessing potential predictors of PTSD diagnoses and PTSD symptoms.

Exclusion criteria included epidemiological studies, studies that only assessed specific aspects of diagnostic symptom clusters, and those that did not assess for the predictive value of implicated variables. The authors determined variance in effect sizes for each identified predictor according to type of sample, length of time between exposure to trauma and assessment of PTSD symptoms, type of trauma, and method used to assess for PTSD symptoms and diagnosis (Ozer et al., 2003). A number of variables were examined, including type of trauma and past mental health diagnoses, however perceived threat during trauma exposure was identified as a notable predictor (Ozer et al., 2003). Perceived threat was identified as a statistically significant predictor of PTSD across 12 studies (combined N=3,524), with a weighted average correlation of .26, which the authors describe as a "statistically significant effect in the small-to-medium range" (Ozer, 2003). This indicates that individuals who perceived high levels of threat and believed that their life was in danger endorsed higher rates of PTSD diagnoses and severity symptoms with effect sizes ranging from .13 to .49 (Ozer et al., 2003). The strength of this relationship remained consistent across samples and measurement methods. Studies did show that time is an important factor, as the strength of the relationship between perceived life threat and PTSD symptoms was weaker in studies that occurred shortly after the traumatic event (1-6 month weighted $r = .24$, $p < .05$) in comparison to studies with more time elapsed since the traumatic event (6 months to 3 years weighted $r = .44$, $p<.05$) (Ozer et al., 2003). In discussing the significance of examined predictive variables, the authors described predictors yielding coefficients greater than .20 as strong predictors whose roles in PTSD development should be further investigated (Ozer et al., 2003). While the publication dates of the studies included in this metanalysis range from 1984-2000, a number of foundational studies on PTSD risk factors are

included, resulting in a robust summary of foundational research on factors that might predict PTSD development.

To examine the role of threat perception in posttraumatic stress, 356 adult survivors of motor vehicle accidents (211 males, 145 females) were surveyed at admission to an Ohio hospital, and again at 6 weeks and at 6 months post-accident (Irish et al., 2011). Attrition rates were moderate in the study, as 251 participants completed the 6-week follow-up and 196 participants completed the 6-month follow-up (Irish et al., 2011). Significant gender differences were present at both follow up periods: at 6 weeks post-accident, 10.36% of the participants (6 males and 20 females) met PTSD symptom criteria and at 6 months post-accident 7.14% of the participants (2 males and 12 females) met PTSD symptom criteria (6 week follow up: $F = 16.83$, Cohen's $d = .52$, $p<.001$; 6 month follow-up: $F = 10.95$, Cohen's $d = .66$, $p<.001$) (Irish et al., 2011). These findings replicate the tendency for women to develop PTSD at significantly greater rates than men. Researchers also found that women endorsed significantly greater levels of perceived life threat than men ($F = 10.38$, Cohen's $d = .32$, $p<.001$) (Irish et al., 2011). Regression analyses indicated a significant association between female gender and higher perceived threat ($\beta = .16$, $p < .05$) and greater levels of posttraumatic stress at the 6-month follow-up (Irish et al., 2011). However, adding perceived life threat as a mediator did not explain a significant amount of the variance in posttraumatic stress between genders, suggesting that while perceived threat is associated to greater susceptibility for PTSD development, it is not a sole mediator of the varying rates of PTSD (Irish et al., 2011). While this study confirms the presence of a gender difference in perceived threat, it doesn't quite parse out the role of threat perception in PTSD development. Of note, the attrition rates in the study also followed a gender bias, as more males dropped out in between follow-up periods than females. However,

participants with greater endorsement of symptoms were also more likely to drop out of the study. To account for this, the researchers ran identical models with and without those participants at each follow-up period and did not find significant differences in outcomes (Irish et al., 2011).

Early research on the concept of threat appraisal and perception suggested that women may be more likely than men to overestimate the likelihood of danger, to expect harm, and to anticipate an inability to control or cope with the trauma and consequences (Blake, Cook & Keane, 1992; Carver, Scheier, & Weintraub, 1989; Cohen, Kamarck, & Mermelstein, 1983; Thorpe & Salkovskis, 1995; Tolin & Foa, 2002). One such example of threat perception is found in the interpretation of facial expressions. McClure and colleagues (2002) used fMRI to examine gender differences in neural activation in response to images with varying degrees of threat. Seventeen adults and seventeen adolescents, both including 8 females and 9 males, viewed a series of randomized grayscale, adult faces with varied emotional cues (neutral, happy, fearful, angry) and rated how threatening they believed each face appeared on a 5-point Likert scale (McClure et al., 2002). Results indicated that adult women had significantly greater activation in the orbitofrontal cortex and amygdala when rating unambiguous threat cues (angry face), a pattern that was not present in adult male participants (McClure et al., 2002). These findings suggest that there are gender differences in how individuals attend to and interpret threat cues on a biological level, which further supports the idea that women tend to have higher threat interpretations than man in stressful situations.

In an examination of gender, cognitive appraisals, and control, Sarrasin and colleagues (2014) targeted 648 participants from two separate samples of French-speaking Swiss individuals who were gathered online and from a Swiss university. Using MANOVA and

regression analyses, results indicated that masculine traits were correlated with the tendency to appraise stressful events as a challenge with a high internal locus of control and low external locus of control (Sarrasin et al., 2014). Masculine traits were also associated with a decreased tendency to appraise stressful events as a threat with low internal and high external locus of control, especially in female participants (Sarrasin et al., 2014). These results reinforce the lower likelihood for men to view a potentially traumatic situation as a threat. Instead, the connection between masculine traits and a challenge appraisal suggests that men may feel more sense of control during potentially traumatic events and feel capable of managing or changing their environment or situation.

Coping styles

As discussed by Folkman and Lazarus (1980; 1985), coping mechanisms have two distinct purposes: regulating emotions following stressful experiences (emotion-focused coping) and changing the environment that caused that stressor (problem-focused coping). While both types of coping are typically utilized, research has shown that an overutilization of emotion-focused coping is connected with poorer psychological health and adjustment, while problem-focused coping is connected with fewer psychological concerns (Billings & Moos, 1981; Billings, Cronkite & Moos, 1983). In fact, emotion-based coping correlates to poorer stress management and perhaps to more severe PTSD symptoms, while problem-focused coping correlates with better stress management (Baschnagel et al., 2009; Blake, Cook & Keane, 1992; Carver, Scheier, & Weintraub, 1989; Rodrigues et al., 2013; Sharkansky et al., 2000; Tolin & Foa, 2002).

To assess the relationship between coping styles and PTSD, 64 veterans who were admitted to a Veterans Medical Center seeking treatment completed a series of questionnaires,

with service histories including WWII era, Korean War era, and Vietnam era (Blake et al., 1992). Results indicated that veterans meeting PTSD criteria more frequently relied on emotion-focused coping techniques, specifically acceptance and escape-avoidance, than veterans without PTSD (Blake et al., 1992). Blake and colleagues (1992) identify this as a pattern congruent with PTSD symptoms, as their measure of acceptance correlated with the negative cognition self-blame and escape-avoidance is a diagnostic category of PTSD symptoms. While this study is limited to a military population and thus not generalizable to civilian populations, it is the first to identify specific coping styles as likely precipitants to PTSD development.

These results have been replicated in the general civilian populations as well. Gil (2005) modified an ongoing longitudinal study on the effects of various coping styles to assess for their influence in PTSD development following a terrorist attack on a college campus in Israel. The initial sample of 185 students dropped down to a final cohort of 81 students that completed survey measurements 1 week prior to the attack, and 1 week-, 6 weeks-, and 6 months-post attack (Gil, 2005). Using the Multidimensional Coping Inventory (COPE), coping styles were divided into problem-focused coping styles (active coping, planning, suppression of competing activities, restraint coping, and seeking instrumental social support), emotion-focused coping styles (seeking emotional social support, positive reinterpretation, acceptance, denial, and turning to religion), and avoidant coping styles (focusing on and venting emotions, behavioral disengagement, and mental disengagement) (Carver, Scheier, & Weintraub, 1989; Gil, 2005). These coping styles were measured prior to the attack, which would indicate a stable trait of coping style, and after the attack, which would indicate a particular state of coping style. Multiple logistic regression analyses indicated that higher endorsement of state and trait avoidance coping, trait emotion-focused coping style, and lower endorsement of state problem-

focused coping style were significant predictors of PTSD development six months after the terrorist attack (Gil, 2005). Due to the unplanned nature of the study, participants were not screened for psychiatric or trauma history, thus the researchers were unable to assess how prior diagnoses or trauma exposure may have influenced coping patterns or PTSD susceptibility. They also do not report on gender similarities or differences with respect to coping styles within this sample.

Early studies on gender differences in coping styles asserted that women tend to use more emotion-focused coping, whereas men tend to use more problem-focused coping (Blake, Cook & Keane, 1992; Carver, Scheier, & Weintraub, 1989; Ptacek, Smith & Dodge 1994). Conversely, a number of studies have found few gender differences in coping styles or even indicated that women tend to use most coping styles more frequently than men (Tamres et al., 2002). In this meta-analysis, however, the authors categorize included studies by type of stressor, none of which appear to include exposure to a traumatic event (personal health, relationship, achievement, others' health) (Tamres et al., 2002). Furthermore, Tamres and colleagues (2002) identify the importance in studies differentiating between dispositional hypotheses of coping and situational hypotheses of coping. The former would imply that there is a characterological difference between men and women that is reflected in their chosen coping mechanisms, while the latter would suggest that particular situations call for particular coping responses (Tamres et al., 2002). Furthermore, their findings suggest that many coping styles endorsed were dependent on the type of stressor reported (Tamres et al., 2002). Thus, it is possible that the non-traumatic stressors assessed in this meta-analysis are activating a different mechanism for coping than those in PTSD related studies. Perhaps the experience of a traumatic event initiates coping styles that emphasize socialized differences between men and women.

Matud (2004) sought to clarify gender differences in the experiences of and responses to stressful situations in the general population. Convenience sampling resulted in a sample of 2,816 participants (1,566 women and 1,250 men) from local work centers and neighborhood associations who volunteered to complete a number of surveys (Matud, 2004). Results indicated that women scored significantly higher than the men on chronic stress ($F = 11.92$, $p < .01$, $\eta^2 = .005$) and minor daily stressors ($F = 52.04$, $p < .001$, $\eta^2 = .019$), and rated life events as more negative ($F = 5.85$, $p < .05$, $\eta^2 = .002$) and uncontrollable ($F = 10.80$, $p < .01$, $\eta^2 = .004$) than the men (Matud, 2004). MANCOVA analyses identified a significant effect for gender differences in coping styles and variables of emotional control ($F = 63.3$, $p < .001$, $\eta^2 = .122$), wherein women scored significantly higher than men on emotional ($F = 41.60$, $p < .001$, $\eta^2 = .015$) and avoidant coping styles ($F = 58.53$, $p < .001$, $\eta^2 = .021$), while men scored higher than women on rational ($F = 72.05$, $p < .001$, $\eta^2 = .026$) and detached coping ($F = 32.13$, $p < .001$, $\eta^2 = .012$), as well as on emotional inhibition ($F = 108.7$, $p < .001$, $\eta^2 = .038$) (Matud, 2004). Matud (2004) suggests that while rates of stressful events are similar between genders, these results indicate that stress appears to have a greater impact on women, which fits the epidemiological findings that when accounting for type and history of trauma, women experience a more detrimental impact than men. This study also confirms previous findings that women tend to use more emotion-focused coping styles than men, while men more frequently use active, problem-focused coping (Billings & Moos, 1984; Ptacek, Smith, & Dodge, 1994). Matud (2004, p. 1411) further suggests that the identified gender differences in coping styles likely fit with a "socialization hypothesis which predicts that men are socialized to use more active and instrumental coping behaviors, and women are socialized to use more passive and emotion-focused behaviors."

Gender differences have also been identified in ruminative beliefs, with women more likely to engage in rumination and to believe that negative emotions related to traumatic events are difficult to control (McLean & Anderson, 2009; Nolen-Hoeksema & Jackson, 2001). Rumination is defined as "engaging in behaviors and thoughts that passively focus attention on one's symptoms of distress and on all the possible causes and consequences of these symptoms" (Nolen-Hoeksema, 1991). Research has consistently shown that women are significantly more likely than men to report engaging in ruminative, emotion focused responses to distress (Nolen-Hoeksema & Morrow, 1993). This gender difference in rumination is further explained by the beliefs that negative emotions are challenging to control, positive emotions in relationships are a personal responsibility, and negative events are difficult to control (Nolen-Hoeksema & Jackson, 2001).

A prospective, longitudinal study examining potential predictors for increased risk of PTSD development identified rumination as an influential variable (Kleim et al., 2007). With a sample of 222 physical assault survivors who presented to an emergency department for their injuries, researchers assessed variables identified in previous research as potential contributors to PTSD development, including: peritraumatic dissociation, perceived life threat during trauma, peritraumatic emotional responses, history of trauma, history of psychological problems prior to the trauma, family history of psychopathology, post-trauma social support, mental defeat, nowness of trauma memories, negative appraisals of the self, rumination about the trauma, resting heart rate, and primary diagnosis of acute stress disorder (Kleim et al., 2007). Aside from prior trauma history and family history of psychological problems, each of the identified predictors resulted in significant univariate associations with PTSD symptoms (Klem et al., 2007). When considering all significant predictors in a multiple logistic regression analysis,

results indicated that the combination of mental defeat (OR 2.07, p=0.014, 95% CI 1.16–3.70), rumination about the trauma (OR 2.99, p=0.002, 95% CI 1.50–5.96) and prior psychological problems (OR 1.95, p=0.014, 95% CI 1.14–3.31) accounted for the most variance (47%) in identifying cases that would develop (X^2=47.37, p=0.000) (Kleim et al., 2007). Overall, each of the factors pulled from Ehlers and Clark's cognitive model of PTSD predicted PTSD 6 months after injury over and above the preliminary diagnosis of acute stress disorder and explained more variance than that diagnosis (Kleim et al., 2007). With respect to predicting susceptibility to PTSD development, the authors suggest that initial post-trauma symptoms that most often subside organically following exposure may be of less importance than those factors that impede recovery and facilitate the maintenance of PTSD symptoms and that a combination of vulnerability and maintaining variables are likely acting simultaneously (Kleim et al., 2007). Of note, while the predictive quality of several factors was replicated, this study considered a total of thirteen potential predictors in PTSD development which has the possibility of bringing in concerns regarding collinearity and overspecification of the regression model. The sample also reported physical injury as their presenting traumatic event, which has been shown to differ with respect to experienced negative appraisals than other interpersonally based traumas.

Gender roles and Heuristics

When type of trauma and history of trauma are accounted for, there are still significant gender differences in rates of PTSD development. Evidence consistently shows that the way individuals interpret and respond to traumatic events has a tremendous effect on the likelihood of developing PTSD. More specifically, trauma-based research has shown that men and women interpret threats and cope with stressors in different ways. This opens the possibility that socialized gender, and the corresponding cognitive and behavioral tendencies, may influence

trauma responses and thus rates of PTSD development, specifically affording men a protective perspective when experiencing and coping with traumatic events.

Masculinity

The rules and guidelines dictating how any given person is expected to think and behave are continuously shaped and reinforced by social norms. Norms related to gender roles are no different, as most societies have set expectations regarding what is considered acceptable or unacceptable behavior for men and for women (Mahalik, 2003). From an early age, individuals observe what men and women do in particular situations, how that behavior is reinforced or punished, and thus learn what behavior patterns are expected of them with respect to their gender (Mahalik, 2003). These expectations are often not explicitly communicated, as social learning takes place in many ways including simple observation. Pleck (1995, p.19) describes the adoption of masculine ideology as the "internalization of cultural belief systems about masculinity and male gender, rooted in the structural relationships between the sexes," which highlights the stark, socialized behavioral differences that are expected to be present between men and women.

With respect to the current study, it is necessary to examine how Western, patriarchal societies have shaped and defined what traditional masculinity looks like. As described by O'Neal and colleagues (2017), Western societies teach men to be strong and unemotional, hyper focused on success, power, and careers. Violations of these expectations are punished from an early age; boys who cry are ridiculed by peers and popular media depicts physically weak and uncompetitive men as inferior to strong men who don't shy from a fight. However, the conformity to these social norms, or the degree to which a person adheres to them, varies. The degree to which any individual conforms to traditionally masculine norms can vary person to

person, as well as by situation. In an attempt to define and ultimately measure men's conformity to these norms, Mahalik and colleagues (2003, p.1) identify conformity to masculine norms as "meeting societal expectations for what constitutes masculinity in one's public or private life." Factors that might influence the degree of one's conformity to masculine norms include dominant sociocultural influences, communication of descriptive and generalized norms, group and individual factors that filter communication of norms, and the extent to which those group and individual factors affect conformity (Mahalik et al., 2003). As an example, a common expectation set by dominant Western societies is that real men do not cry. This is communicated in all forms of media by depicting men who cry as weak, while those who do not are tough and strong, and by boys and men being punished for showing an emotional response to something upsetting or exhibiting traditionally female traits or preferences. These messages may be further filtered and then differentially enacted by way of group and individual differences. Boys and men with different cultural or familial expectations, socioeconomic or demographic status, and exposure to varied portrayals of masculinity may receive modified messages regarding emotional expression or what it means to be a "man" and thus enact masculinity in their own way.

In order to measure the last piece of the internalizing process, the degree to which men conform to these norms, Mahalik and colleagues (2003) created the Conformity to Masculine Norms Inventory (CMNI). This scale assesses affective, behavioral, and cognitive components of socialized masculine norms. Relevant literature identifying masculine norms in mainstream United States culture and focus groups of men and women were used to identify patterns in social expectations of men (Mahaliket al., 2003). The authors intentionally sought out the perspective of women in creating their outline of masculine norms due to the differentiation Bem (1981) identified in gender schemas. More specifically, for a particular norm to be distinctly

masculine, it cannot be present in norms enacted on women. Through this process, the authors identified 12 masculine norms for the CMNI: Winning, Emotional Control, Risk-Taking, Violence, Dominance, Playboy, Self-Reliance, Primacy of Work, Power Over Women, Disdain for Homosexuals, Physical Toughness, and Pursuit of Status (Mahalik et al., 2003). Four statuses were identified for level of conformity (i.e., extreme conformity, moderate conformity, moderate nonconformity, and extreme nonconformity) and measures of affective, behavioral, and cognitive components are assessed at each conformity level (Mahalik et al., 2003). Thus, a 144-item questionnaire was constructed that included a question to assess an affective, behavioral, and cognitive dimension of masculinity at each of the four levels of conformity for each of the 12 masculinity norms. Factor analyses assessed the structure of the CMNI in a sample of 752 male participants, resulting in the removal of Physical Toughness from the measure due to lack of evidence supporting it as a unique factor (Mahalik et al., 2003). Results did support the construct of CMNI as a 94-item inventory comprised of 11 unique factors and indicated that the measure has strong internal consistency estimates as well as differential validity (Mahalik et al., 2003).

Recent iterations have the CMNI have successfully shortened the length of the scale while maintaining the established integrity of the construct of conformity to masculine norms. Of particular interest in the current study is the CMNI subscale of Self-Reliance, as it measures the tendency for an individual to solve problems on their own and believe in their ability to do so. As discussed with coping tendencies, the belief that one can cope and effectively solve problems has been associated with decreased levels of PTSD. At the same time, however, emotional suppression and social isolation are frequently cited as risk factors for poor psychological functioning follow traumatic exposure (Forbes, Tull, Xie, Chris, Brickman, Mattin, & Wang,

2020). With this in mind, one might expect a dual effect of self-reliance, wherein a moderate level of self-reliance creates the self-efficacy and belief in one's ability to problem solve that might allow a person to approach their trauma reminders and recovery from a perspective that facilitates natural recovery and repair, while a high level of self-reliance might enact avoidance and social withdrawal that can be more predictive of PTSD development.

With respect to gender differences in anxiety-based disorders such as PTSD, fear responses are often viewed as incongruent with masculine roles and expectations. Among children, greater fear reporting has been associated with higher levels of femininity (Muris, Meesters, & Knoops, 2005) and lower levels of masculinity (Ginsburg & Silverman, 2000). Similar findings are seen in adults, with some studies demonstrating a positive relationship between fear and femininity (Dillon, Wolf, & Katz, 1985; Tucker & Bond, 1997), others showing a negative association with masculinity (Arrindell, 2000), and others finding that both high femininity and low masculinity are related to elevated fear (Carey, Dusek, & Spector, 1988).

These results highlight methodological concerns that might exist whenever examining experiences of trauma exposure and PTSD. A primary issue raised in much of the extant literature is that reliability and validity in the self-report, and often retrospective, nature of studies assessing trauma and PTSD. Tolin and Foa (2006) identify reliability and validity concerns with respect to the precise definition of trauma exposure, symptom accuracy, reporting biases, differential effects of cumulative trauma, differences in comorbidity and base rates of psychopathology as issues to address. Specific to the current study's hypotheses regarding gender differences in the experience of trauma and PTSD, epidemiological studies (Norris, Foster, & Weisshar, 2002; Perkonigg, Kessler, Storz, & Wittchen, 2000) examined reported

trauma prevalence rates with and without Criterion A2 - subjective feelings of extreme fear, helplessness, or horror. Both studies found that the diagnostic requirement of self-reported fear response decreased male participants' endorsement of trauma exposure and PTSD symptoms (Norris et al., 2002; Perkonigg et al., 2000). These findings suggested a possible gender difference in the experience and reporting of trauma and PTSD and informed research and alterations in criteria for PTSD in the DSM-5. Researchers determined that inclusion of the subjective reaction to trauma exposure conflated the personal experience, which varies from person to person, with the objective exposure to the traumatic event, in effect limiting the diagnostic inclusion for particular individuals (North et al., 2009). Because of these concerns, the subjective feelings of intense fear, horror, or helplessness in response to trauma exposure criterion was removed from the diagnostic criteria in DSM-5. This criterion change mitigates concerns regarding how gender differences in the experience of fear or willingness to report feelings of fear may influence the gender difference in PTSD rates.

Similarly, the potential for reporting biases skewing results is a concern noted in many studies assessing differential experiences of PTSD. In light of masculine expectations, admitting dysfunction and impact of trauma may be viewed as nonconforming to masculine expectations. In order to assess how gender and trauma type might influence PTSD symptom measurement, Chung and Breslau (2008) analyzed existing data on 1360 participants recruited through a prior Detroit area PTSD study. Trauma was classified by type, differentiating between assaultive trauma and nonassaultive trauma, allowing researchers to assess biases in reporting by gender and by trauma type (Chung & Breslau, 2008). Results from this study show that sex differences in PTSD are unlikely to be attributable to sex-related bias in reporting (Chung & Breslau, 2008). Latent class analyses indicated that there was no evidence of gender related differential reporting

of symptoms within class of disturbance (Chung & Breslau, 2008). This study limits concerns regarding reporting biases in PTSD research as there were no differences in reporting PTSD symptoms by gender. This indicates that masculinity norms likely do not generally encourage men to minimize their symptom experiences and that reporting biases are not impacting differential experiences of trauma and PTSD symptoms.

Heuristics

A common trend in past gender-based research is to operationalize gendered learning as a means of predicting outcomes or behaviors (Addis et al., 2010). As an example, aspects of traditional masculinity have been quantified by using measures such as the Conformity to Masculine Norms Inventory, Male Role Norms Inventory, or Gender Role Conflict Scale, and been found to predict a number of negative outcomes, including greater levels of depression and drinking (Shepard, 2002; Wells et al., 2014) and lower help-seeking behaviors and relationship satisfaction (Burn & Ward, 2005; Vogel et al., 2011). While this perspective may help researchers explain what is happening in terms of how masculine traits interact with the world, it fails to consider the context of these situations, or why masculinity is associated with particular events and outcomes, thus limiting the ability to fully understand or change that interaction (Addis et al., 2010).

Attending to the functionality of socialized gender roles will allow researchers to better understand how the learning and enactment of gender influences how individuals perceive and respond to their environments (O'Neil et al., 2017; Addis et al., 2010). Considering the role of gender in responses and decision making suggests the possibility that gender roles form heuristics, specific socialized frameworks for effortlessly navigating a range of stimuli and interactions. These heuristics, or mental shortcuts, are automatic processes that remove the need

for cognitive workload when assessing problems and predicting the efficacy of potential solutions, with the intent of minimizing harm and maximizing benefits (Tversky & Kahneman, 1974). Literature on cognitive processes often differentiates between two types of thinking with respect to decision making: System one and System two. System one cognitive processes are quick, intuitive, automatic, while system two cognitive processes are slow, deliberate, and controlled (Kahneman, 2003; Sloman, 1996). Researchers have suggested use of a Social Heuristics Hypothesis which suggests that learned social strategies, especially those that are typically advantageous, are internalized to the point of automatic, system one thinking (Rand et al., 2016). These social strategies extend to socialized gender roles, as individuals are most often rewarded for adhering to the beliefs and behaviors that are expected with respect to their gender. Furthermore, research has suggested that the awareness of the expectations based on gander accounts for a portion of the variability in a range of gendered behaviors (Brescoll, 2011; Rand et al., 2016).

The effortless system one thinking of heuristics allow individuals to act quickly in situations where snap decisions are paramount and where probabilities of actions are uncertain due to the inability to utilize logical theories to determine optimal solutions (Gigerenzer, 2008). In studies on decision making in risky situations, researchers consistently find that individuals rely on simple heuristics that seem to maximize their chances for a beneficial outcome (Venkatraman et al., 2014). A gender heuristic would imply that socialized masculinity and femininity create specific interpretation and response patterns that allow men and women to access automatic frameworks in their assessment and problem solving in the midst of stressful situations that do not allow the time or cognitive workload of effortful thinking, including traumatic events.

Summary

Research has clearly identified gender differences among variables that appear to protect against or contribute to the risk of developing PTSD. Because these variables are shown to vary by gender, the current study aims to distinguish what role gender socialization and learned behaviors have in an individual's perception of and response to trauma. The current study will examine how adherence to variables that align with traditionally masculine gender norms may act as a protective factor in the development of PTSD following trauma exposure. More specifically, we will assess whether particular patterns of coping, self-reliance, and appraisal styles, lower centrality of events, threat appraisal, rumination relate in a way that comprises a Masculine Heuristic style. Furthermore, we will examine whether this Masculine Heuristic enables individuals to automatically assess and respond to stressful and potentially traumatic situations in a way that protects them from developing PTSD symptoms. This will be done by exploring the presence of a Masculine Heuristic as well as the way it moderates the relationship between trauma and PTSD symptom severity. It is hypothesized that while type of trauma exposure predicts the severity of PTSD symptoms, endorsement of the Masculine Heuristic Construct will impact the strength of that effect. As literature begins to focus on gender as a complex construct that is shaped by culture, traditions, race, class, and individual characteristics and that influences the way in which a person perceives and interacts with the world, this study will examine whether this Masculine Heuristic can be present and protective for women as well as men.

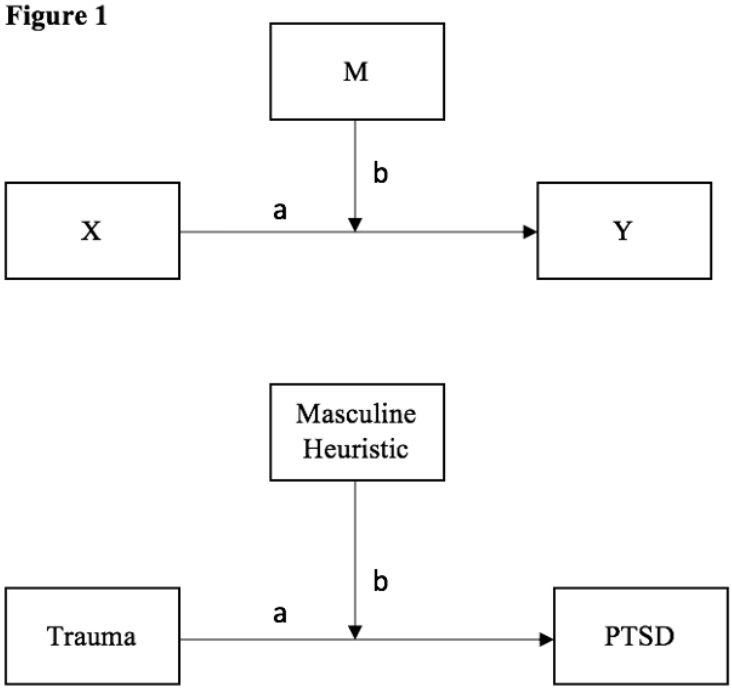
CHAPTER 3

METHODOLOGY

Introduction

Identifying the influence of socialized gender on the interpretation and management of traumatic events will contribute to a more comprehensive understanding of mechanisms behind the gender discrepancies in PTSD development and perhaps inform more adequately tailored trauma focused treatments. The goal of this study is to determine if adherence to traditionally masculine gender norms facilitates a heuristic pattern of cognitive and behavioral responses to traumatic events that predict a decreased likelihood of developing PTSD symptoms. More specifically, this study will examine a model that identifies a masculine heuristic as a moderator between trauma exposure and PTSD symptoms and development. A moderation model is used because it is hypothesized that a traditionally masculine heuristic style will influence the strength of the relationship between trauma and PTSD (See Fig. 1). Conversely, mediation would suggest that trauma exposure enacts some change in heuristic style, which in turn effects change in PTSD symptoms. Research shows that trauma variables, specifically the type of trauma and presence of a trauma history, are positively associated with PTSD development regardless of the person's gender. The aim of this study is to assess how subscription to traditionally masculine beliefs and behaviors might weaken that relationship.

Figure 1



Research Questions and Hypotheses

1. Does a traditionally masculine heuristic style exist?
    a. Individuals will show patterns of endorsement on variables of interest that align with expected traditional male socialization. It will be expected, for example, that participants who endorse high self-reliance will also endorse active and detached coping styles, as well as low threat perception, centrality of events, rumination, and negative cognitions. SEM will be used to construct a measurement model determining whether these proposed variables hang together in a way that is indicative of a latent construct (masculine heuristic).
2. What is the relationship between trauma exposure, a masculine heuristic, and development of PTSD symptoms?

a. Endorsement of a heuristic style comprised of more traditionally masculine cognitions and behaviors will moderate the relationship between trauma exposure and PTSD symptom severity at a statistically significant level.
b. Lower threat and negative appraisal patterns, endorsement of active and non-emotional coping styles, lesser rumination and centrality of events, and greater self-reliance, constructs that are more commonly associated with traditional masculinity, will decrease the strength of the relationship between trauma exposure and PTSD symptom severity.

3. Is this moderation effect significant for both men and women?
    a. This moderation effect will be present regardless of gender (i.e. BOTH men and women who report adherence to this traditionally masculine heuristic will be less likely to develop PTSD following traumatic events).
4. Will type of trauma predict severity of PTSD symptoms?
    a. It is predicted that direct trauma, or traumas that a person directly experienced or witnessed, will lead to greater severity of PTSD symptoms while indirect trauma, or traumas that a person learned of in some way, will lead to lesser severity of PTSD symptoms.

Research Design

This study utilized a causal-comparative/quasi-experimental design in an attempt to establish a cause-effect relationship. The independent variables were identified but not manipulated. Instead, the measure of interest is the effect of said independent variables (i.e., trauma measured by LEC-5 endorsement and hypothesized Masculine Heuristic measured by Self-reliance, PTCI, CES, PTQ, CSQ, and threat appraisal) on the dependent variable (i.e.,

severity of PTSD symptoms as measured by PCL-5 endorsement). There was no random assignment to groups, rather groups were determined by naturally formed, pre-existing categories. The study hypotheses include that subscription to a Masculine Heuristic based in socialized masculine gender norms and behaviors will partially moderate the relationship between trauma exposure and PTSD development through the observed variables of rational coping style, threat appraisal, negative cognitions, self-reliance, rumination and centrality of events. Moderator variables are also described as interaction variables because they predict the strength of the relationship, or the interaction, between two variables (Kline, 2005). Said another way, moderators are variables that alter the strength of an already identified causal relationship (Baron & Kenny, 1986).

In this study, Masculine Heuristic was a latent variable because it was not directly measured. Instead, this Masculine Heuristic was comprised of several observed variables including rational coping, threat assessment, negative appraisal, self-reliance, rumination and centrality of events (see Figure 2). In the hypothesized model, the latent Masculine Heuristic variable acts as the moderator variable, predicting the strength of the relationship between trauma exposure and PTSD symptomology, both of which are directly observed variables (see Figure 3). Thus, a moderation model was constructed to determine if an automatic masculine style of responding to traumas was present, and if said response style predicted a decreased strength in the relationship between trauma exposure and PTSD development.

Figure 2

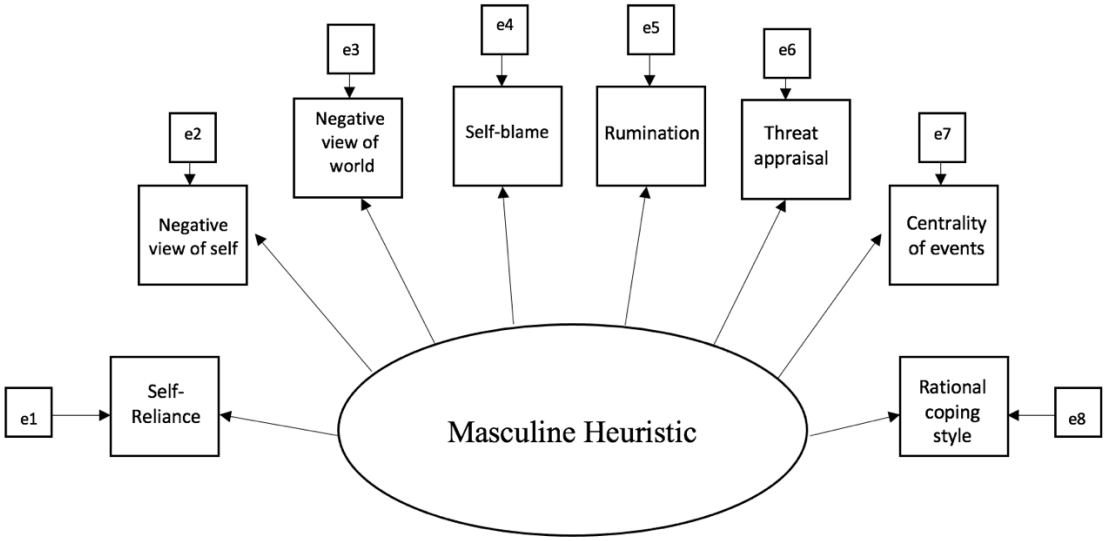
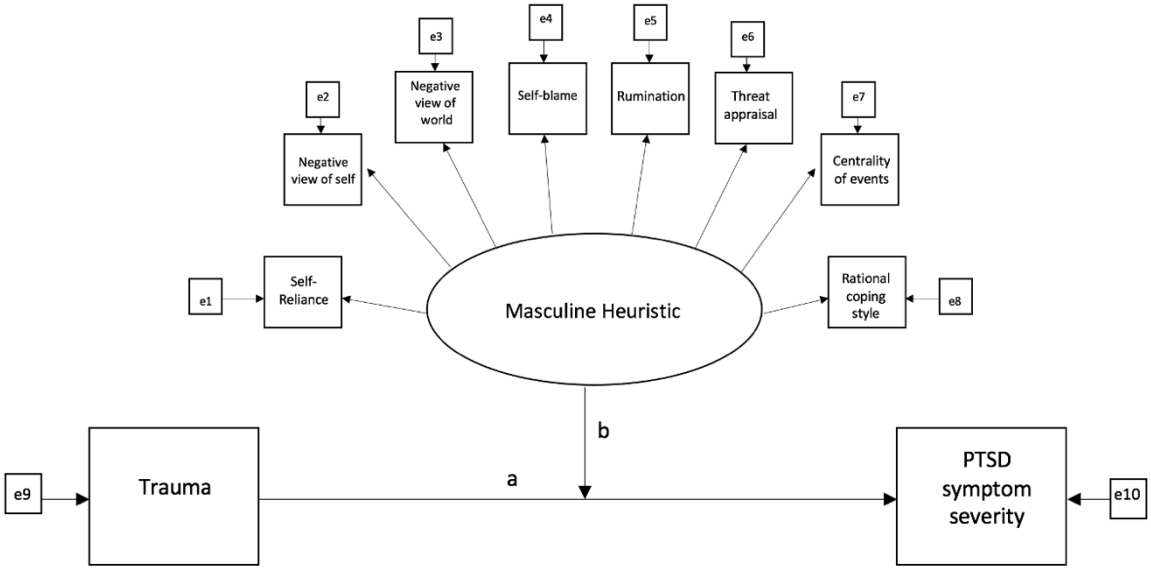


Figure 3



Statistical Analysis

Structural Equation Modeling (SEM) was used to explore the relationship between trauma exposure, a Masculine Heuristic, and PTSD symptom severity in the current study. The measurement model and structural model components of SEM allow researchers to assess the fit

of the proposed relationships between directly measured variables and hypothesized overarching constructs without direct measurement and between multiple hypothesized constructs (Kline, 2005). The measurement model component is used to test the significance of the relationship between the observed variables and the latent variables. Observed variables, also called indicators, are those that are directly measured while latent variables are comprised of the observed variables and are the proposed constructs researchers are interested in (Hoyle, 1995). More specifically, the measurement model allows researchers to evaluate how well the observed variables combine to assess the underlying hypothesized constructs (Weston and Gore Jr., 2006).

For example, the Masculine Heuristic tested in the current study was a latent variable, as there was no direct measurement of the construct. Instead, it was proposed that this Masculine Heuristic was comprised of a specific pattern in the observed variables of Coping Style, Threat Appraisal, Self-Reliance, Negative Cognitions, Centrality of Events, and Rumination (See Figure 2). Confirmatory factor analysis (CFA) was used to construct and test the fit of the measurement model, with a stronger relationship between observed variables indicating a more accurately defined latent variable (Weston & Gore Jr., 2006). Modifications may be required to ensure the measurement model has an appropriate fit and accurately defines the latent variable. Model modification might include adding covariances or removing observed indicators that do not accurately fit within the latent construct as hypothesized.

Once an accurate model has been specified, the structural model component of SEM is used to test the relationships among other variables (Weston & Gore Jr., 2006). In other words, the measurement model was specified for the Masculine Heuristic latent variable. Following any modifications, the proposed structural model was used to test the relationship between Trauma Exposure, Masculine Heuristic, and PTSD. The relationships between latent variables can be

considered covariances, or nondirectional correlations, direct effects, or indirect effects (Weston & Gore Jr., 2006). A direct effect indicates that the predictor variable has a causal effect on the outcome variable (Rex, 2011). According to Baron and Kenny, (1986) an indirect effect occurs when the relationship between an independent latent variable and a dependent latent variable is influenced by one or more latent variables.

Along with experts in the field, Weston and Gore Jr. (2006) describe six necessary steps within the aforementioned process of SEM model testing: data collection, model specification, identification, estimation, evaluation, and modification (Hoyle, 1995; Kaplan, 2000; Kline, 2005; Schumacker & Lomax, 2004). These steps will be further described in detail beginning with model specification. Model specification requires that researchers specify the relationships they hypothesize to exist, and not exist, among the observed and latent variables (Weston & Gore Jr., 2006). These specifications are hypothesized a priori and are to be supported by extant research. In SEM, any unspecified relationships between variables are presumed to be equal to zero within the model as misspecifications, or inaccurate hypotheses regarding relationships, decrease the accuracy of the overall model (Weston & Gore Jr., 2006). The hypothesized model fit for this study is depicted in Figure 3. There was one direct and one indirect effect included in the model. In Figure 3, path a is the proposed direct path between the independent predictor variable, trauma type, and the outcome variable, PTSD symptom severity, while path b is the proposed indirect, moderating path where Masculine Heuristic influences the relationship between the independent and dependent variable. The paths of these relationships can be set to nonzero values and not estimated, set to zero and not estimated, or free to be estimated (Weston & Gore Jr., 2006).

The second step in SEM is model identification, which determines whether a “single, unique value for each and every free parameter can be obtained from the observed data” (Hoyle,

1995; p. 4). This step involves examining the determined paths of the hypothesized relationships that were not set to a specific value and thus free to be estimated. There are two requirements for model identification, specifically that there must be at least as many observations are there are free model parameters and that every latent variable must be assigned a scale (Kline, 2005). Said another way, researchers must have the same number, if not more, directly measured items than the number of parameters free to be estimated and each latent variable must be comprised of observed parameters. Model fits are described as under-identified when a single, unique value cannot be identified for each of the free parameter variables, also indicating that the model requires more data or information than the researcher has available (Hoyle, 1995; Weston & Gore Jr., 2006). Kline (2005, p. 106) describes under-identified models as a "deficit of observations." Just identified models are those that have theoretically unique solutions that perfectly fit the data through a single manipulation (Hoyle, 1995; Kline, 2005). Model fits are considered to be over-identified when they have fewer parameter estimates than observations, thus allowing that multiple values might be found for each of the parameters free to be estimated (Kline, 2005).

Once the model has been specified and determined to be identified, step three in SEM is model estimation. In model estimation, researchers determine the values of any unknown parameters that are free to vary in the model as well as the associated error (Weston & Gore Jr., 2006). In sum, model estimation involves data analysis to identify the estimates for free parameters. The type of estimation procedure will primarily be based off the distribution of the collected data and sample size, as well as data type. Due to having both continuous and ordinal variables in the proposed model, the current study used weighted least square mean and variance adjusted (WLSMV) estimation to identify estimates for free parameters. Maximum likelihood

(ML) estimates were also considered as this method is able to work effectively with moderate violations of normality and maximizes the likelihood that the observed covariances in the data were drawn from the population, or how likely it is that the obtained data is representative of the population (Kline, 2005). The estimation process involves iterative methods, which are a repeated series of attempts to obtain the free parameter estimates that result in a covariance matrix similar to the covariance matrix in the observed data, with each of these attempts resulting in implied covariance matrices (Hoyle, 2005). The implied covariance matrix is compared to the observed covariance matrix, with differences resulting in the residual matrix (Hoyle, 2005). Step three of SEM requires that this iteration process continue until the residual matrix cannot be minimized any further (Hoyle, 2005).

Step four in SEM is model evaluation, which is evaluating the fit of the model to the data. The goal of model evaluation is to determine if the relationships among observed and latent variables in the proposed model accurately reflect the relationships observed in the data (Weston & Gore Jr., 2006). According to Weston and Gore Jr. (2006), model fit should be evaluated with respect to: "(a) significance and strength of estimated parameters, (b) variance accounted for in endogenous observed and latent variables, and (c) how well the overall model fits the observed data, as indicated by a variety of fit indices." There are several different analyses and indices available for evaluating model fit. Martens's (2005) study suggests that the perspective commonly taken by social scientists reflects the assumption that approximating observed data is acceptable and can result in important contributions to the literature. Researchers (Hoyle & Panter, 1995; Weston & Gore Jr., 2006) recommend that researchers report several indices of overall model fit.

Evaluating the model fit is most often done using the $\chi 2$ goodness-of-fit test, wherein smaller values are indicative of a better fit and a $\chi 2$ value of zero indicates a perfect fit (Hu & Bentler, 1999). Other fit indices of importance in evaluating SEM goodness of fit include Comparative Fit Index (CFI), Root Mean Squares Error of Approximation (RMSEA), Standardized Root Mean Square Residual (SRMR), and the Biayesian Information Criterion (BIC). Recommendations for evaluating fit indices include CFI value range between .90 and .95 with higher score indicating better fit, RMSEA less than .10 with upper confidence interval of .10, SRMR value range between .08 and .15 (Weston, 2006).

The fifth and final step in SEM involves model modification or respecification, as the originally proposed model is most often not the best-fitting model for the observed data (Weston & Gore Jr., 2006). Model modification involves "adjusting the estimated model by freeing (estimating) or setting (not estimating) parameters" (Weston & Gore Jr., 2006, p. 744-745). This step allows the researcher to adjust the model to create a better fit for the observed data and relationships between variables. Relevant literature indicates that model modification is warranted, so long as the respecification adjustments are grounded in theory and hypotheses rather than utilizing post hoc explorations (Kline, 2005; Weston & Gore Jr., 2006). Guidelines also suggest that model respecification is typically completed only if the model is underidentified, results in poor fit, or does not converge (Kline, 2016).

Using SEM for the current study allowed this researcher to determine the interactions between variables, including a latent variable, and how they influence an outcome variable (Weston & Gore, 2007). Because the proposed masculine heuristic is a construct hypothesized to be composed of other measurements, SEM allows this latent variable to be created and then tested within the model. In this study, there was one moderator that was tested – the latent

variable of a masculine heuristic. Confirmatory factor analysis (CFA) is used to create the latent variable and to reduce measurement error within the model (Weston & Gore, 2007)

Moderation in the current study was defined by the interaction effect between an independent variable (i.e., Trauma Type) and the moderating variable (i.e., Masculine Heuristic) that influences the strength of an existing, causal relationship (PTSD symptom severity) (Baron & Kenny, 1986). It was hypothesized that while type of trauma exposure predicts the severity of PTSD symptoms, endorsement of the Masculine Heuristic would impact the strength of that effect. As an example, a participant with a history of direct trauma exposure and high endorsement of the Masculine Heuristic was hypothesized to have decreased PTSD symptom severity compared to a participant with history of direct trauma exposure and low endorsement of this construct.

Next, multigroup comparison was used to determine if this Masculine Heuristic protects both men and women from PTSD symptom development. Said another way, multigroup comparison explored whether the Masculine Heuristic equally moderated the relationship between Trauma Type and PTSD for male and for female participants. Using multigroup comparison allows researchers to test the fit of the model on two groups and determine if the model fits both groups equally (Weston & Gore, 2007). If there is no difference in model fit between the male and female participants, that would be indicative of the Masculine Heuristic benefitting both groups. If there is a significant difference in model fit between the male and female participants, this would suggest that this heuristic moderates the relationship between trauma and PTSD differently between the groups. For multi-group comparison models, research suggests that 100 observations per group is sufficient (Kline, 2005).

Participants

Participants were recruited via online community boards, including Facebook and Reddit. A priori power analysis suggested a desired sample size of N = 400 to account for estimated parameters and covariances (Kline, 2016). A total of 316 participants completed the survey online via a Qualtrics link. Guidelines for sample size in Structural Equation Modeling (SEM) vary. Weston and Gore (2006) identified 200 participants as the minimum recommended sample size for SEM, while analyses with correlating variables likely require more participants. The nature of the current study, specifically exploring a latent variable made up of constructs that are theoretically expected to vary together, suggested that greater than 200 participants would be required. Another traditional rule of thumb includes sample size of 5 to 10 per freely estimated parameter (Bentler & Chou, 1987). Further guidelines suggest that sample size varies with model complexity, data quality, and variable types, finding that sample requirements decrease when the number of indicators of a factor increased (Wolf et al., 2013).

Of note, the collected sample pool was insufficient to meet sample size requirements to maintain desired power at the proposed number of free parameters that would exist in a model containing second order latent variables or treating each observed indicator (i.e. each individual question in each subscale) as an observed indicator. Thus, composite scores, specifically the sums, of each subscale will be used as the observed indicator variable for the subscale. While preferences vary, with many statisticians agreeing that composite scores (average or sums of scales) lose measures of variance within that scale, research has identified composite scores of established scales as sufficient for structural analyses (Landis, Beal & Tesluk, 2000). In fact, in an exploration of the use of composite scores in structural equation modeling, Landis and colleagues (2000) found that several types of composite scores allowed for adequate analysis and

further found that models of fit actually improved when composites of measures were used instead of individual indicators. This improvement in fit was especially pronounced at smaller sample sizes including N=300 or fewer (Landis et al., 2000). This suggests that when available sample size precludes the use of each individual scale question as an observed indicator, use of composite scores is a sound, justified option.

Sample size constraints influenced the use of composite measures in the current study, which also adheres to maintaining well-established, theoretically based construct specificity (Landis et al., 2000; Bagozzi & Edwards, 1998). Each subscale used in the current study has undergone factor analysis to ensure unique factor loading. For example, in establishing the PTCI-9 as a good measure of post-trauma cognitive changes, confirmatory factor analysis identified 3 distinct factor loadings with good model fit ($\chi 2(24) = 44.50$ ($p = .007$), CFI = .95, TLI = .92, RMSEA = .09, probability RMSEA $\leq .05 = .07$, 90% CI = [.04, .12], SRMR = .05.) (Wells et al., 2019). This shows that each of the 3 subscales of the PTCI-9 measure unique, theoretically linked constructs that are expected to vary together. Recent research examining the impact of bias when using composite scores as indicators of latent variables suggested that use of several types of composite scores, including unweighted composites, performed similarly to PLS-SEM in terms of effect on bias, efficiency, and accuracy in measurement (Yuan & Tang, 2020). Thus, the current study will use summed total scores of each established measure, as these measures use total sum to describe the measure score. This will be further addressed in the discussion section.

Despite constraints on recruitment, more than 200 participants and more than 5-10 participants per parameter are met, suggesting adequate power incorporated in analysis. Exclusion criteria for all participants included incomplete surveys, failure to produce random

code that implies accurate completion and serves as attention check, taking fewer than 3 minutes to complete the survey. Any participants who reported zero endorsement of trauma history were directed to the end of the survey and thus did not provide further data. Finally, participants who endorsed gender identities outside the male-female binary identity were excluded from data collection due to exploratory nature focused within the gender binary.

Measures

The Life Events Checklist (LEC-5; Weathers et al., 2013). The LEC-5 is the most recent version of the LEC, which assesses for participants' history of trauma exposure. This measure was used as a filter for respondents' trauma exposure. Only those participants who identified learning about, witnessing, or experiencing a traumatic event were included in the analysis. Gray and colleagues (2004) reported that the LEC shows adequate stability and convergence with well-established measures of trauma history, and that the LEC is significantly correlated, in the predicted directions, with PTSD symptoms and measures of psychological distress. The original LEC was created in concert with DSM-IV symptom criteria for PTSD. Minor changes to the LEC were made resulting in the LEC-5 to better fit DSM-5 criteria and include two phrasing changes regarding exposure to accidental death, with changes in psychometric properties not expected (Weathers et al., 2013). Because experiencing a traumatic event is required for survey completion, data from LEC-5 will also determine trauma type. All participants endorsed multiple traumatic exposures, thus the distinction between trauma types such as interpersonal traumas (i.e., sexual or physical assault) and impersonal traumas (i.e., motor vehicle accidents or natural disasters) was not able to be assessed. Instead, the LEC responses were used to determine whether the traumatic event was a direct or indirect exposure, which is aligned with the above research regarding type of traumas predicting PTSD symptom severity. More specifically, it will

be measured as a categorical variable, wherein the participant identified direct (i.e., “happened to me,” or “witnessed it”) or indirect (i.e., “learned about it,” or “part of my job exposure to one or many traumatic events”). A direct exposure will be coded as 1 and indirect coded as 0.

The PTSD Checklist-5 (PCL-5; Weathers et al., 2013). The PCL-5 was used to measure the presence of PTSD symptomology. The PCL-5 is a 20-item self-report measure that assesses the presence and severity of PTSD symptoms, based on DSM-5 criteria, on a 5-point Likert scale. The PCL-5 can be used to quantify and monitor symptoms over time, to screen individuals for PTSD, and to assist in making a provisional or temporary diagnosis of PTSD (Weathers et al., 2013). Questions on the PCL-5 correspond to particular symptom clusters in the DSM-5 including avoidance, hyperarousal and negative alterations in mood (e.g: "Avoiding external reminders of the stressful experience (for example, people, places, conversations, activities, objects, or situations)?”). Severity of symptoms can be determined by adding scores of each item together to determine a total score which can range from 0-80 with higher scores indicating heightened symptoms.

Psychometric research indicates that the PCL-5 is an effective screener for PTSD symptoms and shows robust correlation with the Clinician Administered PTSD Scale ($r = 0.929$) which is a gold standard for in depth PTSD diagnostic evaluation (Blanchard et al., 1996). Research has also demonstrated strong internal consistency ($\alpha = .94$ to .96), test-retest reliability ($rs = .74$ to .85), and convergent and discriminant validity (Blevins et al., 2015; Bovin et al., 2016). While the PCL-5 is not a diagnostic measure, it does provide information regarding the severity of possible PTSD symptoms and may provide a provisional PTSD diagnosis. Research suggests a cut-off score of 31-33 being indicative of probable PTSD with other cutoff scores

ranging from 28-37 (Ashbaugh et al., 2016; Blevins et al., 2015; Bovin et al., 2016; Cohen et al., 2015).

The Conformity to Masculine Norms Inventory-30 (CMNI-30; Levant et al., 2020). The CMNI-30 was used to assess participants' subscription to traditionally socialized male norms. The CMNI-30 is a short form version of the Conformity to Masculine Norms Inventory (Mahalik et al., 2003). The subscales of the CMNI-30 include Emotional Control, Winning, Playboy, Violence, Heterosexual Self-Presentation, Pursuit of Status, Primary of Work, Power over Women, Self-Reliance, and Risk-Taking. Thirty items (e.g., "I never ask for help", "I put myself in risky situations") are rated on a 4-point Likert-type scale ranging from strongly disagree to strongly agree. Scores of each subscale are totaled with higher scores on the CMNI-30 subscales are indicative of greater endorsement of behaviors and beliefs that are representative of culturally defined traits of masculinity.

Psychometric testing of the CMNI and CMNI-30, indicates that the inventory has strong internal consistency, high construct validity, and high test–retest reliability (Ludlow & Mahalik, 2001; Levant et al., 2020). However, research has suggested that the total score of the CMNI is not indicative of an overall measure of conformity to masculine norms, as it accounts for too little variance (Hammer, Heath, and Vogel, 2018). Instead, the authors suggest that the CMNI is effective at measuring the conformity to specific types of masculine norms (Hammer, Heath, and Vogel, 2018). Because of these findings, the current study will not utilize CMNI as a global measure for adherence to masculine roles but will instead assess one particular subscale of masculine norms: self-reliance. The self-reliance subscale of the CMNI measures preferences related to self-reliance and asking for help. CFA shows that the 9-factor model fit well ($\chi 2$ (360) = 786.46, p< .00), CFI = .961, TLI = .953, RMSEA = .033, 90% CI = [.030, .036], SRMR =

.037), suggesting that each of the 9 factors measures a unique aspect of masculine norms and that the self-reliance subscale measures a distinct construct.

Posttraumatic Cognitions Inventory-9 (PTCI-9; Wells, Morland, Torres, Kloezeman, Mackintosh, & Aarons, 2019). The PTCI was used to measure maladaptive beliefs related to traumatic events. The PTCI-9 is a 9-item measure arranged on a Likert scale ranging from 1 (totally disagree) to 7 (totally agree). Items load onto three factors, negative cognitions about self, world, and self-blame, as well as a total score (e.g. "There is something wrong with me as a person," "People cannot be trusted," "There is something about me that made the event happen"). Factor structure in PTCI-9 among civilian trauma survivors shows good model fit loading onto 3 distinct variables ($\chi 2$ (24) = 44.50 (p = .007), CFI = .95, TLI = .92, RMSEA = .09, probability RMSEA $\leq$.05 = .07, 90% CI = [.04, .12], SRMR = .05) The PTCI has been shown to have good internal consistency and reliability, convergent validity, and discriminates well between traumatized people with and without PTSD (Wells et al., 2019). Responses are measured by calculating total scores on each of the three factors, where higher scores represent higher endorsement of maladaptive beliefs about self, world, or self-blame. The Masculine Heuristic is expected to include low endorsement of posttraumatic cognitions, thus reverse scoring of the PTCI-9 subscales will be utilized.

Centrality of Events Scale – short form (CES; Berntsen & Rubin, 2007). The CES short form was used to measure participants' experience of event centrality. The CES short form is a 7-item measure arranged on a 5-point Likert scale ranging from 1 (totally disagree) to 5 (totally agree). It has been found to correlate well with PTSD measures (PCL; $r = 0.39$, $p < 0.0001$), be a significant predictor of PCL scores ($\beta = 0.37$, $t = 6.33$, $p < 0.0001$), and to have adequate reliability (alpha = .88) (Berntsen & Rubin, 2007). CFA shows acceptable fit, despite higher

RMSEA, for a single factor model of the CES short form ($\chi 2$ (14) = 56.95, CFI = .914, RMSEA = .133, 90% CI = [.098, .170], SRMR = .066). Higher scores on the CES indicates that the traumatic event has been more incorporated into an individual's identity a memory that they overidentify with. Due to hypothesized loading pattern of the Masculine Heuristic construct, reverse scoring of the CES is also utilized as it is expected that lower CES scores will be represented in this latent construct.

Perceived life threat. To measure perception of threat during trauma, participants rated the degree to which they feared for their life during their trauma on a scale from 0 (not at all) to 4 (very strongly), which has been shown to be an effective measure of threat perception in previous studies (Halligan et al., 2003; Timmer-Murillo, Schramm & deRoon-Cassini, 2022). Threat Appraisal will be reverse scored due to expected loading pattern onto the Masculine Heuristic.

Perseverative Thinking Questionnaire (PTQ; Ehring et al., 2011). The PTQ was used to measure the degree to which participants tend to engage in ruminative thinking. Participants rated statements such as "Thoughts intrude into my mind" or "My thoughts repeat themselves," on a scale from 0 (never) to 4 (almost always). The PTQ has shown high internal consistency and test-retest reliability, both for the total scale and the three subscales (repetitiveness, intrusiveness, difficulties with disengagement) (Ehring et al. 2011). Furthermore, factor analyses across several studies support one higher-order factor and three lower-order factors of the PTQ, meaning that the construct of ruminative thinking, which is the variable of interest in the current study, is comprised of 3 factors (Ehring et al., 2011). Higher scores on the PTQ represent higher endorsement of rumination. It is hypothesized that the Masculine Heuristic will include lower endorsement of rumination, thus the PTQ is also reverse scored.

The Coping Styles Questionnaire (CSQ; Roger, Jarvis, & Najarian, 1993). The CSQ measures participants' preferred styles of coping. The CSQ is composed of 60 items spread across 4 distinct constructs identified by factor analysis: Rational coping, Avoidant coping, Detached coping, Emotional coping. Test-retest reliability for the CSQ scale scores ranges from .701 to .801 (Roger, Jarvis, & Najarian, 1993). A total score is not collected for the CSQ as correlation amongst scales is not expected. Rather, this measure identifies which type of coping styles individuals adhere to most often. Coefficient alphas for internal consistency of each scale ranges from .69 to .897 (Roger, Jarvis, & Najarian, 1993). The Rational Coping subscale is used in the current study which indicates a greater use of logical, problem solving responses to stressors such as an ability to "Work out a plan for dealing with what has happened."

Procedure

Participants in this study were recruited utilizing community boards, including Facebook groups and Reddit listings. Groups were identified by completing searches including "trauma," "survivors," "PTSD," and "support." Administrators for each group were contacted prior to posting to determine if posts regarding academic research would be allowed and appropriate in the group. Once approved, a link was posted into groups providing a general explanation and rationale for the study, outline of types of questions to be asked, and explanation of compensation that individuals could follow to engage with survey. Upon agreement to participate in the study, participants were informed of the voluntary nature of the study, that they are able to discontinue at any time, and that all information will be kept confidential to the primary investigators. This reminder was included in the description of the survey and in the informed consent. Participants were informed that choosing to open the survey operated as their online consent and reminded that they can opt out of the survey at any time.

Participants who opted into taking the survey were provided the link to a Qualtrics survey with instructions and estimated time of 12-13 minutes to completion. The survey site contained the informed consent, a brief demographic questionnaire, and the self-report instruments including: (a) LEC; (b) PCL-5; (c) brief gender demographic; (d) Perception of Threat; (e) Self-reliance subscale of CMNI-30; (f) rational coping subscale of CSQ; (g) PTCI; (h) CES; (i) PTQ. Upon completion of the surveys, participants were entered into a random drawing for compensation. A total of 6 individuals were selected randomly to receive a $25 prepaid VISA gift card. Per Wisconsin lottery and gaming regulations, recruitment material explicitly stated that anyone was eligible for entry into the drawing and given the opportunity to submit an email address for participation. Upon completing the survey, participants were directed to a separate Qualtrics link to submit email for drawing entry, thus ensuring anonymity and separate storage of survey responses and emails for compensation.

CHAPTER 4

RESULTS

Participants

316 individuals over the age of 18 years old took the one-time survey for the current study. Participants were recruited from social media sites including Facebook and Reddit. Of the 316 participants, 45 did not complete any of the questionnaire beyond the LEC and 13 identified as trans or gender nonconforming. These 58 respondents were thus removed from the dataset leaving 258 total participants with complete datasets for analysis. Of the 258 participants, 143 identified as male and 115 identified as female. All participants indicated that they experienced at least one traumatic event over their lifespan. Because all participants self-reported exposure to at least one traumatic event, variance for LEC independent variable was zero. To improve analysis, LEC was further identified into direct (happened to me, witnessed it) and indirect (learned of, part of my job) trauma exposure.

Data Analysis

SPSS AMOS software was used for analysis of data. Following data cleaning for exclusionary factors, there was no remaining datasets with missing data. Initial examination of univariate outliers removed 53 response sets that fell outside the 25^{th} and 75^{th} percentiles. These outliers were removed from the analysis. While removing these datasets decreased the sample size, the number of observations still met previously discussed criteria adequate for SEM analysis. The limitations stemming from sample size and analysis power and outcome will be discussed in the following chapter. Univariate skew and kurtosis are within acceptable ranges suggesting normality of data, while multivariate skew and kurtosis imply violation of normality. Multivariate nonnormality indicates the presence of a nonnormal distribution resulting in unusual

variable combinations. Further outlier examination identified the Mahalanobis distances of independent variables, which measures the distance between a multivariate data point and the mean distribution. Said another way, this identified variable combinations that are extreme outliers from the average pairings. Guidelines suggest removing cases with a distance greater than $\chi 2$ value of 95% (Brereton, 2014). However, this identified 24% of the data as an outlier to be removed from the dataset, which may suggest that the identified outliers are indicative of truly representative data and would likely have further negative impact on statistical power of the model. Furthermore, research suggests that removing cases to address multivariate nonnormalities should be balanced with retaining model power and interpreting nonnormality within results (Gao, Mokhtarian, & Johnston, 2008). Thus, this portion of the data was not removed from the dataset. Instead, the multivariate nonnormality will be incorporated into analyses by using likelihood estimates that account for multivariate nonnormality such as the weighted least square mean and variance adjusted (WLSMV) estimator.

Intercorrelations for study variables and descriptive statistics are outlined in Table 1, with correlations of the Masculine Heuristic computed by total observed scores of indicator scales. There are some correlations among observed indicators, but items are not as correlated as expected, which likely impacts the integrity of the measured latent construct. For example, the CMNI Self-Reliance subscale correlates with the fewest number of other observed indicators, including the CSQ Rational Coping subscale, both of which are most grounded in traditionally masculine norms and beliefs. Self-Reliance and Rational Coping both measure an individual's approach to problem solving and beliefs that they can be efficacious in overcoming stressors. Considering this theoretical similarity between these two subscales, the lack of correlation

between these items is unexpected. Furthermore, the lack of correlations may be indicative of a poorly identified latent construct which will be explored with further analyses.

Table 1
Descriptive Statistics and Intercorrelations for Study Variables

	1	2	3	4	5	6	7	8	9	10
1. LEC										
2. PCL	-.178**									
3. Threat Appraisal	-.192**	-.237**								
4. CMNI	0.057	.116*	-.154**							
5. CSQ	0.045	0.088	-0.104	0.062						
6. PTCI - Self	0.104	-0.005	.251**	.155**	-.348**					
7. PTCI - World	-0.008	-0.069	.226**	.164**	-.281**	.654**				
8. PTCI – Self Blame	.123*	-0.064	.247**	.206**	-.131*	.627**	.533**			
9. PTQ	0.030	-.407**	.319**	0.004	-.349**	.547**	.582**	.543**		
10. CES	-0.003	-.383**	.268**	0.079	-.288**	.521**	.599**	.570**	.869**	
11. Masculine Heuristic	0.058	-.290**	.338**	.170**	-0.064	.683**	.728**	.740**	.879**	.878**

Note: PCL-5 = PTSD Checklist, CMNI = Conformity to Masculine Norms Inventory, CSQ = Coping Styles Questionnaire, PTCI = Post-Trauma Cognitions Inventory, CES = Centrality of Events Scale, PTQ = Perseverative Thinking Questionnaire.
Values below diagonal line represent intercorrelations of observed scale scores. *p < .05, **p < .01

Measurement Model

The first research question is examining whether a traditionally masculine heuristic style exists. It was hypothesized that participants who endorse high self-reliance will also endorse rational coping styles, as well as low threat perception, centrality of events, rumination, and negative cognitions, a pattern that aligns with research on traditional male gender learning. This hypothesis is tested within the measurement model of the current study. To measure the fit of the proposed measurement model, Confirmatory Factor Analysis (CFA) using maximum likelihood estimates was first conducted to assess whether the observed indicators loaded onto the latent

variable of Masculine Heuristic as hypothesized. Figure 4 shows the one factor confirmatory factor model tested in the measurement model.

To estimate the amount of variance each observed indicator accounts for in the latent construct, factor loadings of each indicator were calculated. Strong factor loading indicates that the observed indicators do account for and share a proportion of variance in the latent construct, which is expected of items that are proposed to be theoretically similar. To evaluate these factor loadings, the standardized multiple correlations, standardized factor loading, composite reliability, and average variance extracted have been computed and the results are presented in Table 2. Given typical guidelines suggesting that factor loadings should be greater than .50, with ranges from .40 to .70, the results show that the standardized factor loadings of Rational Coping Style, Self-Reliance, and Threat Appraisal are not ideal (Matsunaga, 2010). However, they do reach levels of statistical significance and thus are kept in the model. Similarly, AVE, which is the average percentage of variation explained, is less than the minimum threshold of .50. Squared multiple correlations are the extent to which a measured indicator's variance is explained by a latent factor, with studies suggesting .50 and greater as sufficient threshold (Hair, Anderson, Babbit, & Black, 2010). Composite reliability measures the reliability and internal consistency of the observed indicators representing a latent construct, with the composite reliability measuring greater than the minimum threshold of 7.0. Rational Coping Style was also found to have a negative factor loading, which indicates that it is negatively related to the latent variable and that the loading pattern with other variables is incongruent to the hypotheses. These unexpected findings, as well as the decision to keep the latent model intact, will be discussed further in the next chapter, but likely indicate further concerns with the latent variable identification.

Table 2
Convergent and Discriminant Validity

Factor	Items	SMC	SFL	CA	CR	AVE	FL	Sqrt AVE
Masculine Heuristic	Centrality of Events	0.498	0.706***	0.617	0.774	0.409	0.64	0.639531
	Rumination	0.559	0.748***					
	Self-Blame	0.667	0.817***					
	Negative View of the World	0.715	0.846***					
	Negative View of Self	0.585	0.765***					
	Rational Coping Style	0.122	-0.35***					
	Self-Reliance	0.032	0.18*					
	Threat Appraisal	0.095	0.309***					

Note: SMC=Squared Multiple Correlations, SFL=Standardized Factor Loadings, CA=Cronbach's Alpha, CR=Composite Reliability, AVE=Average Variance Extracted, FL=Fornel Lacker Criteria.
*p < .05, **p < .01, ***p<.001

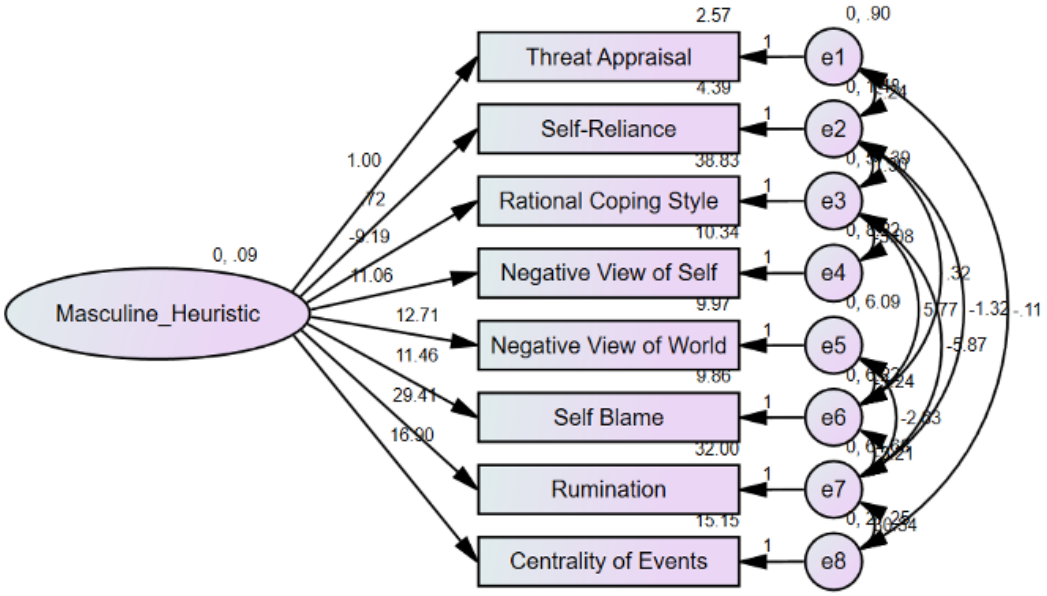
Determining goodness of model fit for CFA on the measurement and structural models was based on recommendations of $\chi 2/df < 3.0$, comparative fit index (CFI) > 0.90, and root mean square error of approximation (RMSEA) < 0.10 (Kline, 2016). It is hypothesized that all of observed indicators are measuring a portion of one construct, thus creating a theoretical foundation for each of the observed indicators to correlate with one another. Because of this expected correlation between the observed indicators and the hypothesis that they are measuring one greater construct, the residuals of the indicator variables were allowed to covary in the measurement model CFA. The fit indices of the measurement model along with acceptable bounds of each measure are summarized in Table 3 and indicate acceptable model fit: $\chi 2$ (8) = 11.103, CFI = .997, TLI = .990, RMSEA = .036, SRMR = .028. This indicates that the proposed measurement model is an acceptable fit to the data and that the observed indicators share some amount of covariance that indicates measurement of a greater construct.

Results suggest, however, that the majority of variance is accounted for by trauma specific risk factors and that proposed indicators related to gender learning do not account for a significant amount of variance. This likely means that the proposed measurement model failed to adequately capture a "masculinity" heuristic. Rather, results from the measurement model analysis suggest that the latent construct in this model is one driven by trauma specific variables, potentially replicating existing measures and research regarding post-traumatic changes in thinking patterns. The indicators with poor factor loading were not removed from the measurement model, as their removal would eliminate both indicators explicitly grounded in traditional masculinity and thus alter the remaining research questions. Because these findings suggest that the latent construct does not fully capture a masculine heuristic as hypothesized, the remaining analyses will be interpreted within this context and thus referred to as the Latent Construct rather than the masculine heuristic. The implications of the measurement model finding regarding model identification and efficacy will be further discussed in the next chapter. See Figure 4 for a visual of the Measurement Model.

Table 3
Measurement Model Fit Indices

Measure	**Estimate**	**Threshold**	**Interpretation**
CMIN	11.103	--	--
DF	8.000	--	--
CMIN /DF	1.388	Between 1 and 3	Excellent
CFI	0.997	>0.95	Excellent
SRMR	0.028	<0.08	Excellent
RMSEA	0.036	<0.06	Excellent
PClose	0.642	>0.05	Excellent
IFI	0.997	>0.95	Excellent
TLI	0.990	>0.95	Excellent

Figure 4
CFA Measurement Model



Moderation Model

The second research question related to the nature of the relationship between trauma exposure, a masculine heuristic, and development of PTSD symptoms. Moderation is an interaction effect between an independent variable and the moderating variable that influences the strength of an existing, causal relationship (Baron & Kenny, 1986). In the current study, trauma type is an independent variable that predicts the severity of PTSD symptoms, while the Latent Construct is hypothesized to moderate that direct relationship. It is hypothesized that while type of trauma exposure predicts the severity of PTSD symptoms, endorsement of the Latent Construct will impact the strength of that effect. As an example, a participant with a history of direct trauma exposure and high endorsement of the Latent Construct is hypothesized to have decreased PTSD symptom severity compared to a participant with history of direct trauma exposure and low endorsement of this construct.

Despite not fully capturing masculinity within the measurement model, it was hypothesized that endorsement of the proposed Latent Construct would moderate the relationship between trauma exposure and PTSD symptom severity at a statistically significant level and more specifically that it would decrease the severity of PTSD symptoms reported. This hypothesis is examined via testing the structural moderation model. The structural model tests how the Latent Construct acts as a moderator variable to influence the relationship between the independent variable, trauma exposure, and the dependent variable, PTSD symptom severity. It tests the direct paths, including path a between Trauma Type and PTSD symptom severity and path c between the Latent Construct and PTSD symptom severity. It also tests path b, the indirect moderating path. If the effect of this indirect interaction is significant, it implies that the direct effect of the primary independent variable (trauma type) on the dependent variable (PTSD symptom severity) is dependent on the level of the Latent Construct (Little, Caird, Bovaird, Preacher, & Crandall, 2007). The latent moderation was tested by creating an interaction term between the independent variable and the Latent Construct, measured by Trauma Type and the observed indicator of total score on the Latent Construct. This creates an interaction term between trauma type and the Latent Construct to test the indirect moderation path (Marsh, Wen & Hau, 2004). The overall sample moderation analysis is assessed before completing the multigroup moderation analysis that assesses how the moderation may differ by gender.

Table 4 and Table 5 summarize the results of the overall structural model moderation path analysis. The results support the hypothesis that experiencing a direct trauma significantly increases PTSD symptom severity (β=1.406, $p < .05$). They also support the hypotheses that the Latent Construct in the model has a significant moderating effect on the relationship between the trauma and PTSD symptom severity. The direct effect of the Latent Construct on PTSD

symptom severity is significantly positive (β=0.611, $p < .05$), which indicates that greater endorsement of this construct predicts greater PTSD symptoms. This suggests that lower endorsement of post-traumatic negative thinking patterns, lower rumination, and lower centrality of events increased PTSD symptom severity. As discussed in the literature review, post-traumatic negative thinking patterns, rumination, and centrality of events are all found to predict greater severity of PTSD symptoms. While this direct effect was not expected and is contrary to extant literature, it may be explained by data quality and confounding characteristics. Overlap in PTSD symptoms, general life stress, and other psychiatric concerns introduces the concern for confounding variables within the model along with concerns related to selection bias evident in the recruitment method. These concerns will be discussed at a greater length in the following chapter. It is also a possibility that participants' endorsement of PTSD symptom severity is reflective of a range of stressors and not directly assessing PTSD symptoms.

The interactive effect between trauma type and the latent moderating construct has a significant and negative impact on PTSD symptom severity. This effect suggests that the impact of the moderator variable depends on the level of trauma exposure. The interaction term, which is driven by trauma variables including low posttraumatic negative cognitions, low centrality of events, and low rumination, interacts with trauma type significantly moderates the relationship between trauma on the PTSD symptom severity (β=-1.919, $p < .05$). More specifically, among participants with indirect trauma exposure, higher endorsement of the moderating construct predicts increased PTSD symptom severity, while among participants with direct trauma exposure, higher endorsement of the moderating construct predicts decreased PTSD symptom severity. However, with the direct and indirect path standardized beta estimates greater than 1, these results do suggest concerns related to multicollinearity. The overall moderation model

shows strong model fit ($\chi 2$ (17) = 40.738 (p = .665), CFI = .990, TLI = .967, RMSEA = .068, SRMR = .053). See Figure 5 for the overall SEM model. Figure 6 depicts the simple slope analysis of the moderation, wherein trauma type and the level of adherence to the latent construct interact to produce differing severity of PTSD symptoms. Higher adherence to the moderating construct predicts decreased PTSD symptom severity with direct trauma exposure while higher adherence to the moderating construct predicts increased PTSD symptom severity with indirect trauma exposure. These results will be discussed in further detail in the following chapter.

Table 4
Overall Structural Model Results

Relationship	β Estimate	*t* statistic	*p*	Results
Trauma → PCL	1.406	4.522	.000	Significant
Masculine Heuristic → PCL	0.611	3.853	.000	Significant
Trauma * Masculine Heuristic → PCL	-1.919	-5.390	.000	Significant

Figure 5
Overall SEM Model

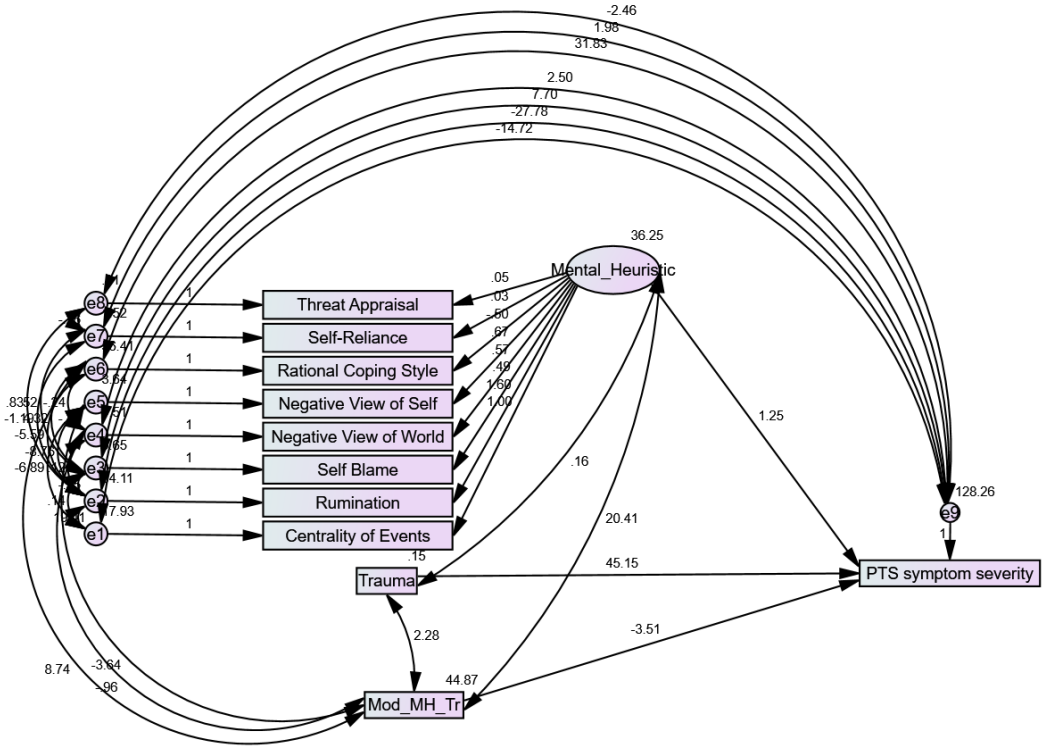
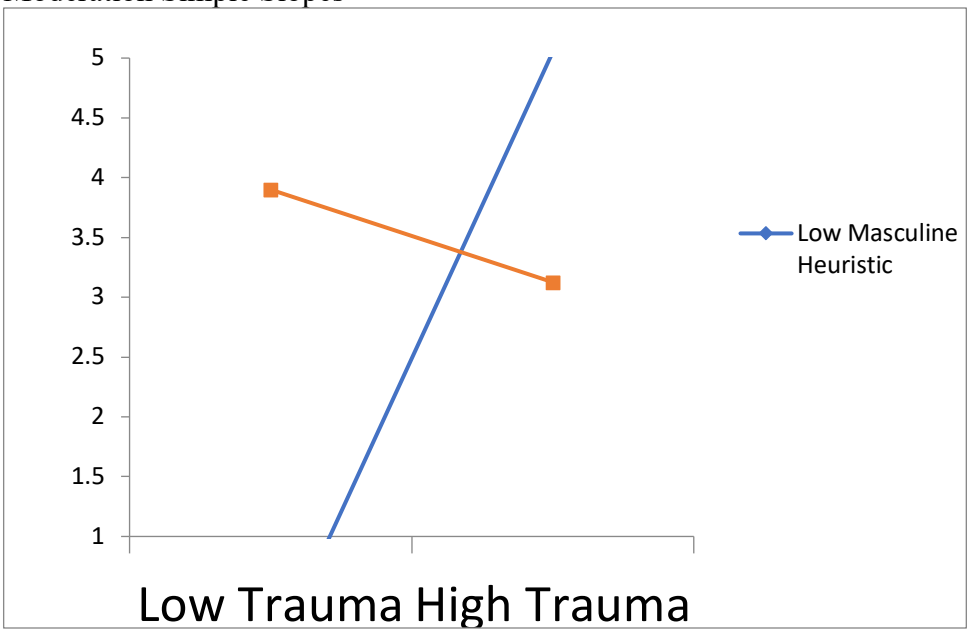


Table 5
SEM Model Fit Measures (Unconstrained Model)

Measure	Estimate	Threshold	Interpretation
CMIN	40.738	--	--
DF	17.000	--	--
CMIN/DF	2.396	Between 1 and 3	Excellent
CFI	0.990	>0.95	Excellent
SRMR	0.053	<0.08	Excellent
RMSEA	0.068	<0.06	Acceptable
PClose	0.127	>0.05	Excellent
IFI	0.990	>0.95	Excellent
TLI	0.967	>0.95	Excellent
GFI	0.978	>0.95	Excellent
AGFI	0.913	>0.80	Excellent

Figure 6
Moderation Simple Slopes



Multigroup Analysis of Moderation Model

The final research question explores whether the moderating effect differs by participant gender. It was hypothesized that there would be no significant difference between structural model fit between male and female participants, indicating that the latent construct equally moderates the relationship between trauma and PTSD symptoms between groups. Multigroup

analysis was utilized to test the structural moderation model between male and female participants in order to determine if the moderating effect is equal across both groups. As with the overall sample analysis, product indicator method was used to create the latent variable interaction (Kenny & Judd, 1984). Multigroup model testing places equality constraints between various models in order to compare a model with a particular parameter constrained to be equal to a model with that parameter free to be differ between groups (Newsom, 2017). This allows for examination of ways in which predictive paths differ between groups, such as how type of trauma exposure type predicts PTSD symptoms or how the interaction between trauma type and the moderating variable predicts PTSD symptoms differently between male and female participants (Newsom, 2017).

To estimate the effect of gender on the model fit, the unconstrained overall model, which allows for gender variation on the indirect moderating path, is tested against constrained models where gender is set to be equal. Multigroup SEM analysis tests the moderation path of a model allowing separate moderation estimates for male and female participants in an unconstrained model compared to a constrained model where the moderation path is set to be equal between male and female participants. By constraining the moderation path, the difference in model fit can be compared via loglikelihood test which assesses whether there is a significant difference in model fit indices between the unconstrained and constrained models (Newsom, 2017; Rijsdijk & Sham, 2002). A nonsignificance in model comparison implies the absence of gender difference on this path, while a significant finding indicates that the moderation path differs by gender. Due to the observed multivariate nonnormality and use of ordinal and continuous variables, weighted least square mean and variance adjusted (WLSMV) estimator will be used to examine model fit.

Table 6 and Table 7 summarize the results of the constrained multigroup moderation analyses. The multigroup moderation model shows strong model fit ($\chi 2$ (34) = 59.13, CFI = .990, TLI = .966, RMSEA = .049, SRMR = .050). The results support the hypothesis that the moderation model will not differ by gender and will be statistically significant for both male and female participants. This means that the latent construct has an equal and significant moderation effect on the relationship between trauma and PTSD symptoms regardless of gender. The results also indicate that direct path between trauma and PTSD symptom severity was statistically significant and without significant difference between male (β=1.406, $p < .001$) and female (β=1.406, $p < .01$) participants (β difference=.630, p=.559). Finally, the results also indicate that the moderation effect between trauma type and the latent construct was statistically significant for both male (β = -2.302, $p < .001$) and female (β = -1.475, $p < .01$) participants (β difference = .827, p = .485). See Figure 7 for the male multigroup model and Figure 8 for the female multigroup model. Table 8 summarizes the global test between the constrained ($\chi 2(36)$ =5 9.965) and unconstrained ($\chi 2(34)$ = 59.173) models, with no significant difference in $\chi 2$ values between models. This indicates that there is no significant difference ($\chi 2(2)$ = .792, p=.673) in model fit between genders when the model is allows to constrain for gender differences. Taken as a whole, these results indicate that there are no significant differences in model fit between male and female participants, meaning that the latent construct equally moderates the relationship between trauma type and PTSD symptom severity regardless of gender.

Moderation results indicate that direct trauma exposure and high adherence to the latent construct both have a statistically significant and positive direct impact on PTSD symptom severity. Endorsement of a direct trauma and endorsement of high adherence to the latent construct both predicted increased PTSD symptom severity. The implications of both direct

paths will be further discussed in the next chapter. The indirect, moderating path assessing the interaction effect between trauma type and latent construct, however, produced a statistically significant decrease in PTSD symptom severity, wherein high adherence to the moderating construct decreased PTSD symptoms in individuals who experience direct trauma exposure. The proposed moderating construct equally moderated the direct path across genders. Of note, these multigroup comparison results are all interpreted within the context of a moderation variable that likely failed to capture a masculine heuristic as proposed. Instead, measurement model results indicate that the moderating variable is a construct driven by trauma specific risk factors and interpretations of the final results are to be considered within this limitation.

Table 6
Multigroup Modeling

Path Name	Male Beta	Female Beta	Difference in Betas	p-value for Difference
Trauma → PCL	1.718***	1.088**	.630	.559
Mod_MH_Tr → PCL	-2.302***	-1.475**	-.827	.485

Table 7
SEM Model Fit Measures (Constrained Model)

Measure	Multigroup Models	Threshold	Interpretation
CMIN	59.137	--	--
DF	34	--	--
CMIN/DF	1.740	Between 1 and 3	Excellent
CFI	0.990	>0.95	Excellent
SRMR	0.050	<0.08	Excellent
RMSEA	0.049	<0.06	Excellent
PClose	0.496	>0.05	Excellent
IFI	0.990	>0.95	Excellent
TLI	0.966	>0.95	Excellent
GFI	0.967	>0.95	Excellent
AGFI	0.871	>0.80	Excellent

Figure 7
Multigroup SEM Model (Male)

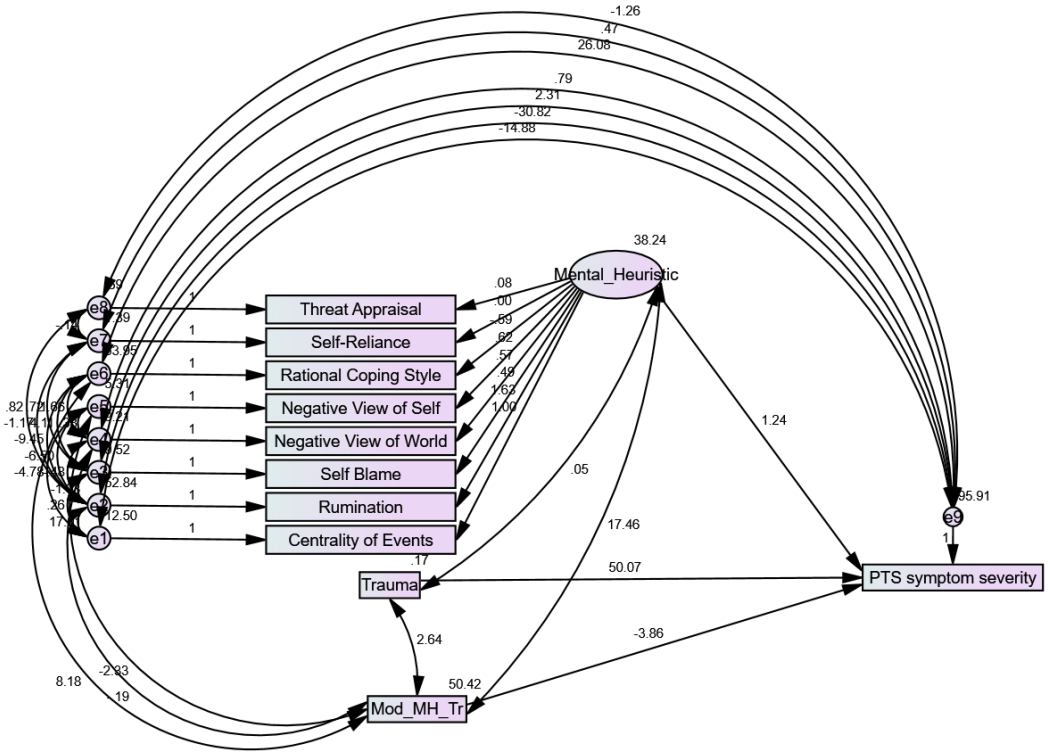


Figure 8
Multigroup SEM Model (Female)

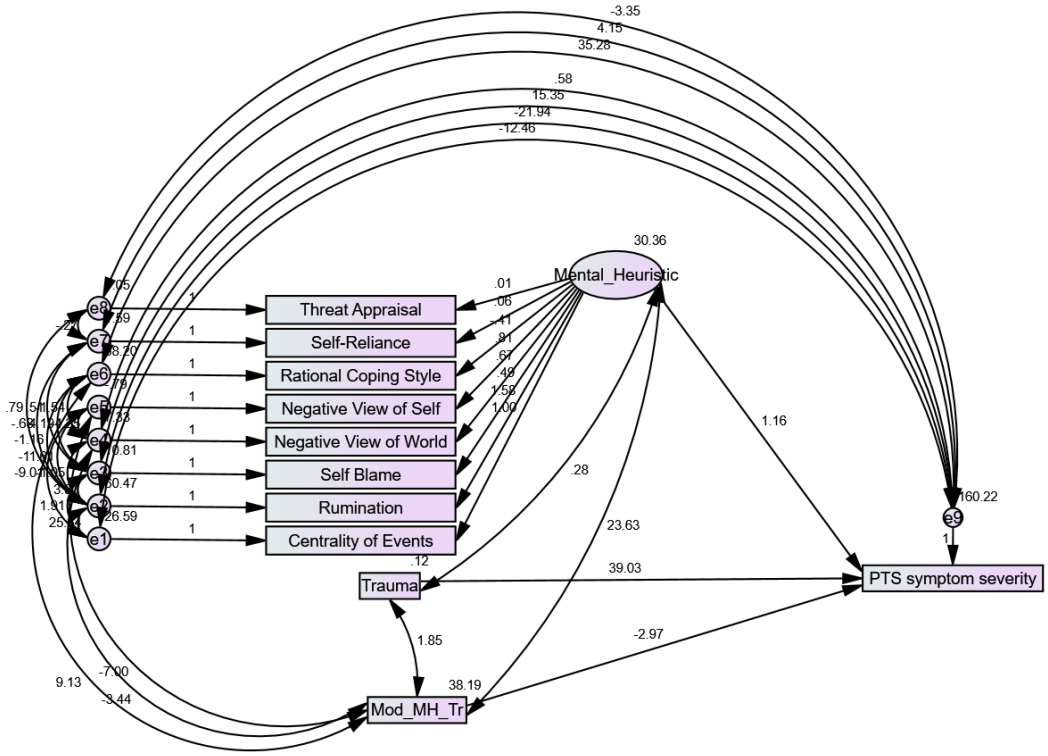


Table 8
Global Test

	X^2	DF
Unconstrained	59.173	34
Constrained	59.965	36
Difference	0.792	2
p-value	0.673	

Interpretation: The p-value of the chi-square difference test is not significant

Summary

The following is a summary of the four research questions and hypotheses along with respective findings. See Figure 9 for the results of the direct and indirect effects in the final moderation model.

Hypothesis 1: The Masculine Heuristic latent variable will fit the data in a statistically significant way to suggest that the observed indicators are measuring a greater construct. The CFA in the measurement model partially supported the hypothesis. The Masculine Heuristic latent variable was a good fit to the model, suggesting that the observed variables share a good amount of variance. However, the variance was mostly accounted for by the PTCI subscales, CES, and rumination. Threat appraisal, rational coping style, and self-reliance accounted for the least amount of variance. Furthermore, the rational coping style negatively related with the rest of the observed variables, suggesting that low use of rational coping correlated with high endorsement of the rest of the indicators. This was an unexpected result and may be indicative of a poorly specified latent variable. It is possible that this measure of coping style failed to capture the self-efficacy beliefs of one's ability to overcome stressors and instead measured aspects of isolation, avoidance, and low help-seeking behaviors, all of which would be expected to negatively correlate with adaptive and growth-oriented behaviors post-trauma that were

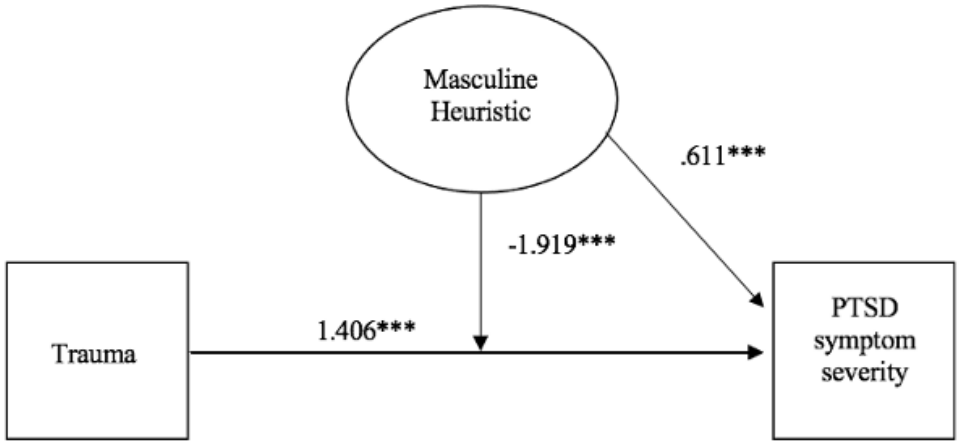
hypothesized to be captured by the proposed latent construct. Due to the highest factor loadings found in the PTCI subscales, CES, and rumination measures, it is likely that the construct in the measurement model, while statistically significant, is mostly accounted for by variance from trauma and cognition variables and failed to adequately capture the proposed masculine heuristic. Thus, the findings from the structural model will be interpreted within this context. This finding and resulting limitations will be discussed further in the next chapter.

Hypothesis 2: The Masculine Heuristic will dampen the relationship between trauma exposure and PTSD symptom severity. This is partially supported by the statistically significant path analysis of the moderation model. The interactive moderation effect between trauma type and the Latent Construct determined that the impact of moderation depends on type of trauma reported. Furthermore, this study failed to establish this moderator as a Masculine Heuristic due to a poorly specified measurement model and cannot interpret findings as evidence supporting the presence of a Masculine Heuristic.

Hypothesis 3: The moderation model will be significant for both men and women. The structural model indicated that the moderation effect is significant for both men and women with no statistically significant difference in model fit between groups. However, the efficacy of this analysis and result without initial testing for multigroup invariance in the measurement model will be discussed further in the next chapter.

Hypothesis 4: Direct trauma will predict greater severity of PTSD symptoms. This hypothesis is supported by the significant direct path findings indicating that endorsement of a direct trauma was a statistically significant predictor of increased PTSD symptoms.

Figure 9
Final Moderation Model



Final moderation model. Parameter estimates represent standardized regression coefficients. ***p < .001

Conclusion

The present study had two purposes. First, to establish a measurement model representative of a masculine heuristic and second to test a moderation model in which the masculine heuristic moderates the relationship between trauma exposure and PTSD symptom severity. Despite reaching statistical significance, the measurement model portion of the analysis failed to capture the proposed masculine heuristic style. Results suggest that the measurement model CFA likely captured significant variance accounted for by trauma specific variables, while the variables most explicitly grounded in traditional masculinity accounted for less unique variance in the Latent Construct. These observed variables were not removed from the latent model due to adequate CFA and measurement model findings and their removal resulting in a theoretically different construct from the one initially proposed. This decision and resulting limitation will be discussed in the following chapter and suggests that the results must be interpreted within this limited context.

Next, the structural model explored an indirect, moderating effect of the moderating construct on the direct relationship between trauma and PTSD symptoms. The direct path between trauma type and PTSD symptom severity was supported by the analysis results, suggesting that direct trauma exposure resulted in greater PTSD symptom severity. Results suggest that the direct path between the proposed moderator and PTSD symptoms is also statistically significant, wherein greater adherence to the moderator construct directly predicted greater PTSD symptom severity. A significant moderating effect was found, indicating that the moderator variable and trauma type interact in statistically significant way. Among participants who endorsed direct trauma exposure, high adherence to the moderating construct predicted a decrease in PTSD symptoms compared to participants with low adherence to the moderating construct. Conversely, among participants who endorsed indirect trauma exposure, high adherence to the moderating construct predicted an increase in PTSD symptoms compared to participants with low adherence to the moderating construct. These results will be summarized more fully in the following chapter, while study and analysis limitations, future recommendations, and potential implications of the results will also be addressed.

CHAPTER 5

DISCUSSION

The purpose of this study was to investigate how beliefs and behaviors associated with traditionally masculine gender roles influence the development of PTSD symptoms following exposure to traumatic events. Research consistently implicates variables that have been identified as protective in healthy recovery from trauma exposures fit within traditional messages and socialization related to masculine gender roles. Determining ways in which learned gender behaviors and attitudes impact individuals' beliefs and coping responses to traumatic exposures and stress may inform improved interventions post-trauma exposure.

The first question examined in the current study is whether a Masculine Heuristic response style, comprised of traditionally masculine beliefs and behaviors related to self-reliance, threat appraisal, rational coping styles, centrality of events, post-trauma cognitions, and rumination, is present. Next, this study aimed to determine what relationship that Masculine Heuristic had with trauma exposure and PTSD symptomology. It was hypothesized that the Masculine Heuristic would interact with trauma type to moderate the relationship between trauma exposure and PTSD symptoms and that adherence to this heuristic style would predict decreased PTSD symptom severity. It was also hypothesized that this moderation effect would be significant for both men and women.

Interpretation of Findings

Hypothesis 1: The Masculine Heuristic latent variable will fit the data in a statistically significant way to suggest that the observed indicators are measuring a greater construct

CFA and measurement model analysis partially support the factor loadings of a latent variable in the current study as the measurement model CFA was statistically significant. This

suggests that, to some extent, the data fit the hypothesis that the observed indicators covary together in a way that is indicative of a greater latent factor. However, the observed indicators that accounted for the greatest amount of variance in the Latent Construct were the Posttraumatic Cognitions subscales, Centrality of Events, and Rumination, while Self-Reliance, Rational Coping, and Threat Appraisal accounted for less variance. The CFA results suggest that the trauma driven observed indicators included in the measurement model measure a greater construct, consistent with available literature regarding the connection between negative alterations in cognitions, rumination, and centrality of events in PTSD symptom development.

This study hypothesized that the Latent Construct would be representative of gender-based learning and thus hypothesized that this might be considered a Masculine Heuristic response style. However, the results of the measurement model analysis suggest that Self-Reliance and Rational Coping, the observed indicators most directly associated with masculine gender learning, as well as Threat Appraisal, did not account for a significant amount of variance within the latent variable. This suggests that they were not meaningful or distinct contributors to the variance of the Latent Construct. Furthermore, Rational Coping Style was inversely correlated with the other observed indicators which suggests that a high endorsement of rational coping beliefs and behaviors did not fit the predicted pattern of endorsement wherein high use of rational coping correlated with high Self-Reliance and low Threat Appraisal, Posttraumatic Cognitions, Centrality of Events, and Rumination. Resultingly, while the measurement model was statistically significant, these findings suggest that the latent construct is not representative of the proposed Masculine Heuristic response style primed and created via learning of socialized gender constructs. Thus, the remainder of the study was interpreted within this context and without the use of Masculine Heuristic terminology.

Hypothesis 2a: The Masculine Heuristic will moderate the relationship between trauma exposure and PTSD symptom severity at a statistically significant level

The structural model analyses support the presence of a statistically significant moderation effect on the direct relationship between trauma exposure and PTSD symptoms. Path b, the moderation path, exhibited a statistically significant influence on path a, the direct path, impacting the severity of PTSD symptoms. The significant moderating effect indicates that the moderator variable and trauma type interact in statistically significant way, influencing severity of PTSD symptoms. With a categorical independent variable and a continuous moderator, significant moderation in this case means that the differences between the group PCL-5 means between direct and indirect trauma exposures differ according to the level of the moderator variable. In this respect, the moderator in the current study interacts with type of trauma exposure to produce a statistically significant indirect path between trauma exposure type and PTSD symptom severity.

Hypothesis 2b: Moderation will result in decreased PTSD symptoms

The proposed relationship of the latent moderator was that a particular response style would predict lower scores on PTSD symptoms measured through the PCL-5. In examining the interaction effect between the moderation variable and independent predictor variable, the proposed relationship valence is partially evident. The interaction effect between trauma type and level of endorsement of the moderator variable produced a statistically significant result. Analyses found that among participants who endorsed a history of direct trauma exposure, high adherence to the moderating construct predicted a decrease in PTSD symptoms compared to participants with low adherence to the moderating construct. Conversely, among participants who endorsed a history of indirect trauma exposure, high adherence to the moderating construct

predicted an increase in PTSD symptoms compared to participants with low adherence to the moderating construct.

Hypothesis 3: The moderation model will be statistically significant for both male and female participants

The current findings suggest that the Latent Construct and the interaction effect identified by path b, equally moderates path a, the direct path between trauma exposure and PTSD symptoms for both male and female participants. There were no significant differences in path b between genders, suggesting that the Latent Construct produces a similar effect on PTSD symptom severity regardless of gender.

Hypothesis 4: Direct trauma will predict greater severity of PTSD symptoms

This hypothesis was supported by the significant direct path. Results suggest that endorsement of a direct trauma was a statistically significant predictor of increased PTSD symptoms. This is congruent with the literature indicating that trauma type has a significant impact on PTSD symptom development, with more personal traumatic exposure such as directly experiencing assault, more likely to predict greater PTSD symptom severity (Forbes et al., 2012; Smith et al., 2016). Of note, all participants endorsed experiencing multiple traumas, thus typical distinction between trauma types, such as interpersonal (i.e., physical or sexual assault) or impersonal (i.e., motor vehicle accident or natural disaster) was not possible to assess.

General Discussion

The current study results do support the primary hypothesis that the latent variable explored significantly moderate the relationship between trauma exposure and PTSD symptom severity, regardless of gender. It is, however, not possible to conclude that these results support the identification of the latent variable as a Masculine Heuristic response style. Examination of

the interaction effects between the observed indicators shows that Self-Reliance and Rational Coping Style, two of the observed indicators most explicitly grounded in traditional masculine socialization, were among the three variables that accounted for the least amount of variance in the Latent Construct.

This indicates that the variance accounted for within the Latent Construct, and thus the effect of the moderation, is most explained by the trauma and cognitive specific indicators included in this construct: Posttraumatic Cognitions, Centrality of Events, and Rumination. While extant research as outlined in Chapter 1 shows significant gender differences among these risk factors, the measurement model CFA may not be a sufficient approach to identify this Latent Construct as a socially learned Masculine Heuristic. Rather, it may serve to support existing research regarding the role of trauma and cognitive risk and protective factors in the development of PTSD symptoms. Further suggestions on exploring the role of gender socialization in adherence to these risk factors will be addressed in the following sections.

An unexpected finding while establishing the measurement model was the lack of correlation between the Self-Reliance and Rational Coping observed indicators. These two variables correlated with the fewest number of observed indicators in the measurement model and did not correlate significantly with each other. This suggests that theoretically, Self-Reliance and Rational Coping styles may address different components of self-efficacy and logical, healthy coping that the current study hypothesized are learned via socialized masculinity. Self-Reliance, a subscale of the CMNI-30, measures opinions about asking for help ("I don't mind asking for help") while the Rational Coping subscale of the CSQ measures approaches for logical problem solving in the face of stressors or obstacles (Levant et al., 2020; Roger, Jarvis, & Najarian, 1993). From this perspective, the lack of correlation between the two may make more

sense, as beliefs regarding help-seeking and self-efficacy related to problem solving do not necessarily overlap. The lack of correlation between these observed indicators and other variables in the measurement model might be explained by the theory supporting the hypotheses behind exploring the Masculine Heuristic latent variable. Research indicates that men are more likely to be self-reliant and utilize rational coping styles, tendencies that may be grounded in socialized gender learning and theoretically relate to risk and protective factors for PTSD development (Gil, 2005; Matud, 2003; McLean & Anderson, 2009; Nolen-Hoeksema & Jackson, 2001). For this reason, it would be expected that these items measure a different component of the proposed Masculine Heuristic than the PTCI subscales or CES, for example. The Masculine Heuristic as proposed in the model for the current study failed to capture adherence to masculine norms and attempted to combine potential risk and protective factors into one construct, when it may be more theoretically sound to explore the varying influences of trauma specific risk factors and potential protective factors of masculinity as separate constructs.

An additional unexpected finding was the negative correlation and factor loading of the Rational Coping Style indicator among other indicators and onto the Latent Construct. This suggests that Rational Coping did not fit the hypothesized pattern wherein greater use of rational coping aligned with higher Self-Reliance and lower Threat Appraisal, Posttraumatic Cognitions, Centrality of Events, and Rumination. Considering the hypothesis that greater adherence to the Latent Construct will be protective in degree of PTSD symptom severity, this may indicate that the opposite effect is present for coping styles. More specifically, low adherence to Rational Coping appears to align with the endorsement pattern of the Latent Construct. This could suggest that low endorsement of Rational Coping aligns better with protective patterns of trauma related variables while high use of Rational Coping aligns with higher endorsement of trauma variables

that are implicated as risk factors in PTSD development. This finding may be explained by research on avoidance, emotion regulation, and isolation following trauma exposure. Rational Coping and a reliance on logic may be associated with avoidance and emotional numbing, both of which are implicated as risk factors for PTSD development (Feeny, Zoellner, Fitzgibbons & Foa, 2000; Pineles, Mostoufi, Ready, Street, Griffin & Resick, 2011; Vlachos, Papageorgiou & Margariti, 2020). This also suggests the need to further explore the role degree of adherence to masculinity and other risk or protective factors espouses in PTSD development, as moderate levels of endorsement may serve as protective, while rigid adherence may become maladaptive.

The lack of correlation among these variables and the less-than-ideal factor loadings of Rational Coping Style, Threat Appraisal, and Self-Reliance could have indicated reason for measurement model respecification. However, removing the CMNI and CSQ indicators would result in removing the two observed indicators most explicitly related to socialized masculinity and thus alter the research goal and hypotheses. Furthermore, these measures did reach statistical significance in the CFA analysis and the intact measurement model produced a statistically significant model to fit the dataset, suggesting that the inclusion did not produce a significant detraction from model fit. Thus, the measurement model was left intact. However, the measurement model accuracy failed to capture masculinity as hypothesized which, along with the decision to keep indicators with less-than-ideal factor loading in the model, will be further explored in the following sections.

Examination of the interaction effect of the model tested in the current study gives more information regarding the role of the moderation. The interaction effect indicates that a large amount of the variance in PTSD scores is accounted for by the interaction term created by the moderation variable, the Latent Construct, and the independent predictor variable, Trauma Type.

This suggests that the moderator variable and trauma type interact in statistically significant way to produce an effect on PTSD symptom severity. Among participants who endorsed a history of direct trauma exposure, high adherence to the Latent Construct predicted a decrease in PTSD symptoms compared to participants with low adherence to the Latent Construct. Conversely, among participants who endorsed indirect trauma exposure, high adherence to the Latent Construct predicted an increase in PTSD symptoms compared to participants with low adherence to the Latent Construct. The interaction between type of trauma history and endorsement of the Latent Construct shows how posttraumatic changes in thinking patterns has a differing impact on PTSD symptom development and maintenance depending on type of trauma experienced.

In this regard, the Latent Construct appears to act as a protective factor for individuals who experienced a direct trauma and as a risk factor for those who experienced an indirect trauma. It further suggests that, among participants with an indirect trauma history, lower endorsement of the Latent Construct, which indicates higher scores on Posttraumatic Cognitions, Centrality of Events, and Rumination, predicts decreased PTSD symptom severity, a result that is contrary to consistent research findings. A possible explanation of this finding may be related to the accuracy of participant responses on the PCL-5. While generally considered a robust and psychometrically sound screening tool, a recent examination of the psychometric properties of the PCL-5 identified poor discriminant validity between the PCL-5 and general stress (Sveen, Bondjers & Willebrand, 2016). This opens the possibility for the presence differing interpretations and responses on the PCL-5 and on other measures, where symptom endorsement from individuals with indirect trauma exposure may reflect general life stressors and not PTSD symptoms in particular. Individuals with indirect trauma and low Latent Construct endorsement, which again implies higher PTCI, CES, and PTQ scores, could be endorsing the impact of

general life stress on these measures rather than PTSD specific. More specifically, they may endorse high levels of thinking about and ruminating on their life stressors, but low PTSD symptoms due to a lesser impact on their day-to-day functioning than would be expected with true PTSD symptoms. Individuals with indirect trauma exposure and higher adherence to the Latent Construct may endorse lower use of these risk factors yet endorse responses and symptom patterns that are more aligned with trauma and PTSD specific responses on these measures, thus explaining some of the increased symptom severity.

Similarly, the direct path between the Latent Construct and PTSD symptom severity predicted greater PTSD symptom severity, a result that was unexpected given the Latent Construct's measurement of protective patterns of thinking (i.e., low rumination, centrality of events, and posttraumatic cognitions) and negative correlation with PTSD symptom severity. Falk and Miller (1992) describe this as suppressor effect, which may indicate a near zero relationship between the Latent Construct and PTSD symptom severity, variable redundancy in the model, or important predictor variables truly suppressing other predictor variables. This may also be explained by the possible endorsement of general life stress rather than PTSD specific symptomology as described above. An additional consideration for this finding, as well as the interaction effect and the study as a whole, may be within the context of population sampling and the possibility of confounding variables. While this will be further discussed in the following sections, it is important to note the selection bias of individuals who are self-selecting to join community groups based on trauma exposure. Furthermore, several groups that allowed sampling explicitly mentioned comorbid diagnoses of Borderline Personality Disorder, complex PTSD, and addiction, which introduce additional mental health factors that may contribute to stressors and experiences of symptoms.

Implications

The goal of this study was to determine ways in which socialized gender learning, specifically socialized masculinity, might influence adaptive behaviors in order to explain the gender differences in PTSD symptom development. While significance of the paths in the tested model are significant, these findings must be interpreted within the context of the measurement model likely failing to capture a heuristic style composed of a response patter created via socialized masculinity. The Latent Construct does exhibit a significant moderating effect on the relationship between type of trauma exposure and PTSD symptom severity. However, this is likely replicating existing research regarding the role of posttraumatic cognitions, centrality of events, and rumination in the development of PTSD. The findings do not present new information regarding the theoretical connection between gender roles and learning and the use of these risk factors, but do provide replicating information regarding trauma, risk factors, and PTSD development.

These findings do, however, replicate much of the research outlined in Chapter 1 regarding the role of risk and protective factors in PTSD symptom development. First is the significant direct path between trauma exposure and PTSD symptom severity. While the current study was unable to use more detail regarding trauma type due to all participants' endorsement of multiple traumas, participants with direct and indirect trauma exposure could be distinguished. The significance of this path indicates that participants who directly experienced or witnessed a traumatic event endorsed greater PTSD symptom severity than those who reported indirect exposure, such as learning about the event. Furthermore, lack of gender differences on the tested models aligns with research implicating the significance of trauma type on PTSD development regardless of gender identity.

The unexpected finding that the Latent Construct predicts more severe PTSD symptoms highlights the possible impact of data quality. Due to sampling methods and anonymity, there was no way to track how many respondents came from which online community groups and there was no use of exclusion criteria for other mental health diagnoses. Thus, it is possible that there may be overlap in endorsed symptoms of PTSD and symptoms of depression, anxiety, or other psychiatric presentations that are captured in the higher PTSD symptom severity ratings. Several groups utilized for participant recruitment marketed support for PTSD among other diagnoses, suggesting the possibility of comorbid diagnoses in the sampled pool of participants. Comorbid diagnoses and overlap of symptom profiles are not uncommon in the general public, thus highlights the need for continued research regarding how vulnerability to other diagnoses may influence PTSD development following varied types of trauma exposure (Gros, Price, Magruder & Frueh, 2012).

Perhaps most importantly, the current study failed to truly capture the role of gender learning on patterns of coping with trauma. This suggests the need for better defined constructs and models in future research, as well as thoughtful use of sampling methods. Suggestions on means of better testing the study hypotheses in the measurement and structural models will be explored in the following section. While the inability to capture a Masculine Heuristic within the current study was grounded within the construction of the measurement and structural models, it also highlights the difficulty of capturing the complexities of PTSD risk and protective factors and development within a quantitative research design. The significance of the model tested does, however, support the presence of a moderation interaction between trauma type and the Latent Construct, driven by patterns within Rumination, Centrality of Events, and Posttraumatic

cognitions. The possibility that these patterns are influenced by gender learning was not able to be assessed and thus requires further exploration

Limitations

The first limitation of the current study is related to recruitment methods and resulting sample size. Recruitment via online community groups was intended to obtain a representative sample of trauma survivors with varied trauma experiences and levels of functioning. However, an unexpected challenge in the recruitment process was the difficulty in accessing these groups. Many Facebook pages explicitly denied access to page for posting of "self-serving" material, which included posts related to research. With access to groups limited, an added challenge was engagement with potential participants in groups that did allow postings. Fewer than 15 participants completed the survey for a given posting across one year of data collection and renewing initial post or reposting altogether.

Additionally, participants who were recruited via social media may pose concerns for selection bias, confounding factors, and convenience sampling. It is likely that there are traits and experiences of persons engaged in trauma related Facebook or Reddit groups that could serve as confounding variables, making obtained results less generalizable to the entire population. Over endorsement of traumatic events may be of concern, as all participants endorsed multiple exposures and average endorsement of "learned about it" traumatic events being 5.7 per respondent. Online community groups posed a unique space to directly reach potential participants with histories positive of traumatic events, however the selection bias for individuals who seek out group support in this way might be connected to their unique experiences of trauma and its sequelae. Finally, while the sample size was adequate for the final methods of analysis and maintained desired power, available research and analysis guidelines

indicate that the preferred sample size to minimize error distribution and potential biases would have been the larger 400-600 participants initially sought out for the current study. A larger sample size also would have allowed for the model to include second order latent variables, wherein the variance in each subscale making up the first order latent variable would be preserved, rather than utilizing summed scores as indicator variables. Theoretically, this model design might better fit available research and statistical method preferences regarding measurement constructs at the same time that a larger sample size would better preserve power to limit the impact of error and biases on results.

Another limitation is the absence of demographic data. The goal of this study was to examine the fit of a Masculine Heuristic that guides response to and recovery from traumatic events, and it is hypothesized that this gendered heuristic exists regardless of other demographic variables. However, the intersectionality of race, age, socioeconomic status, and education levels, among other variables, likely impact the internalization and expression of this heuristic response. It might be interesting to explore how adherence to potential masculine heuristic varies, or the heuristic itself changes between age cohorts as gender roles and expression are growing. Demographic variables were not identified as relevant independent variables in the proposed moderation model, and thus were not collected, which resulted in findings that likely cannot be generalized to the population at large. The purpose of the study was to explore how this possible masculine heuristic influences the relationship between trauma and PTSD, regardless of other identities, making exploration of the intersection between gender and other demographic variables within this heuristic context an area of future research.

There are some limitations related to any cross-sectional analysis like the one proposed in the current study as a cross-sectional analysis of not causal and thus no causal links can be

assumed with these results (Winer, Brown, & Michels, 1991). Experimental analysis, however, would be challenging with study content, suggesting that a longitudinal study design would be better equipped to determine how socialized gender roles predict development of PTSD symptoms. Many of the studies included in the literature review utilized a longitudinal approach to identify risk and protective factors in PTSD development as individuals go through the natural recovery process following a traumatic exposure. This would also allow for decreased reliance on retrospective self-report, which may not be the most reliable estimate of PTSD symptom experiences.

Additionally, the proposed methods of the current study did not include establishment of measurement invariance between groups prior to testing the structural model between groups. To accurately determine whether there are any gender differences within the structural model, it must first be established that the measurement portion of the model, comprised of the observed and latent variables, are not functioning differently between groups. It is possible, for example, that the lack of gender differences in the structural model of the current study is actually due gender differences within response patterns in the Latent Construct. If male and female participants are endorsing significantly different patterns within the Latent Construct, the between groups comparison cannot determine that the model is functioning the same between the two groups. Furthermore, the st

The main goal of this study was to establish the possible protective factor connected to adherence to socialized masculine norms by showing that this heuristic quality is adaptive for anyone who engages in it. While the results of this study suggest that the proposed model presented a good fit for the available data, it does not provide the necessary support to suggest that this Latent Construct is representative of a learned gender heuristic that influences trauma

interpretation and response patterns. Rather, it appears more likely to confirm previous research identifying the role of individual and trauma specific risk factors in the development of PTSD symptoms following traumatic exposures. In order to adequately represent a gender heuristic style, the leap from gender differences in risk and protective factors to masculine heuristic style needs to be supported. The measurement model portion of the current study, while evident of a latent construct that is a good fit to the model, does not provide enough support to infer that this construct is evidence of a standalone Masculine Heuristic. Suggestions on how to better establish the presence and role of an adaptive Masculine Heuristic will be addressed in the following section.

Future Recommendations

A primary suggestion for future research is to repeat the study with a greater net for population sampling. The intention for sampling via community organization pages was to directly target trauma survivors while limiting survey engagement by individuals who did not meet inclusion criteria of endorsed trauma history. While this ensured that all participants endorsed trauma history of some kind, it created unexpected obstacles with respect to accessing potential participants and possible introduced confounding variables regarding individual biases related to choices to join community organization pages. It also limits any possibility for generalizability of study results. If the desired sample size had been met, this study would have been able to use second order latent variables to better preserve measurement error and structural organization of subscales subsumed into the proposed Masculine Heuristic. This would allow the analyses to maintain better power while minimizing error, and perhaps be more generalizable to the greater population.

Another future recommendation is to further explore the role of trauma type in the survey. In the current sample responses, all participants endorsed trauma exposure of some kind, and all endorsed experiencing more than one. The LEC, however, does not require selection of worst trauma, nor does the PCL-5 explicitly direct respondents to consider the impact of their index or worst trauma and to exclude the impact of daily stressors on symptom endorsement. To get a more accurate perspective on the role of trauma type in the current model, it would be beneficial to ask participants to identify the most distressing event experienced, the degree to which they experienced it, and how trauma specifically produces symptom elevations on the PCL-5.

The measurement model aspect of the current study produced two primary concerns that could be addressed in future research. First, the poor factor loadings of the observed indicators hypothesized to be grounded in traditional masculinity suggest the need to return to the literature to better define and construct the measurement model, as well as the structural model. The loading structure appears to support a distinction between gender learning variables and trauma specific variables, suggesting a need to better identify the measurement and structural models. In order to better establish the gender role component of a Masculine Heuristic, there needs to be more exploration of how gender learning interacts with the trauma specific observed indicators utilized in the current study.

Second, between group analyses within the measurement model must first be established in order to accurately complete multigroup analyses of the structural model. The current study did not establish measurement invariance between male and female participants within the measurement model, thus there is a possibility that the lack of difference in model fit for male and female participants is actually due to between group differences at the measurement level.

Further research testing between group differences should establish measurement invariance among latent variables within the measurement model prior to examining hypotheses regarding the full structural model differences.

A similar SEM approach examining gender learning within the relationship between trauma and PTSD might distinguish between gender learning and trauma specific risk factors. As an example, adherence to full measures of masculinity and/or femininity might be included as one latent factor while trauma spepcifc risk or protective factors might be included as a separate latent factor. This would allow researchers to explore how gender learning influences the endorsement of trauma specific observed indicators (i.e., threat perception, centrality of events, rumination, posttraumatic cognitions) which in turn moderates the relationship between trauma type and PTSD symptoms severity. It would also be helpful to first establish the presence of a Masculine Heuristic style within the male population, ways in which this heuristic might impact their perceptions of and reactions to traumatic exposures, and then to determine if or how that heuristic response interacts with other gender presentations. This would allow for further generalizations of which aspects of traditional masculinity might serve as protective factors in PTSD development and identify adaptive functional aspects of masculinity that can inform teaching of adaptive skills across gender identities.

CHAPTER 6

FIGURES

Figure 1

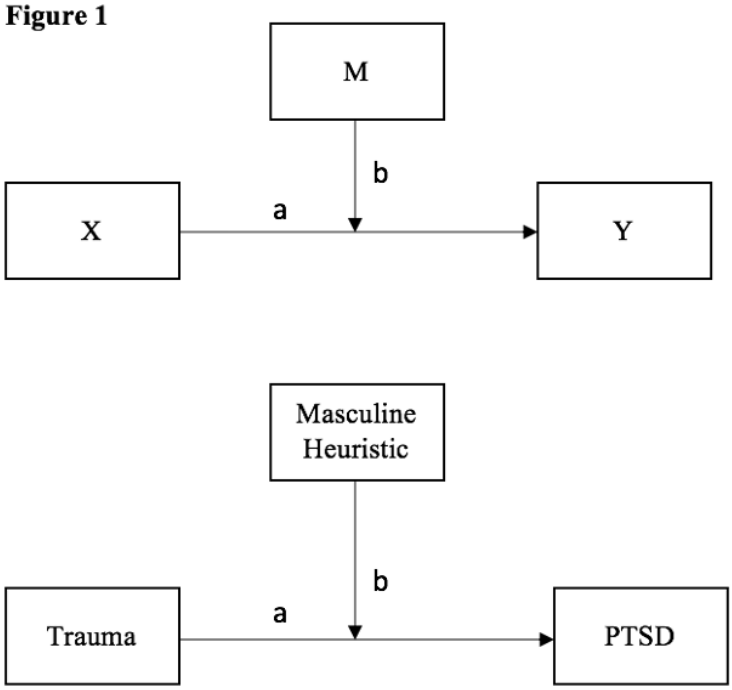


Figure 2

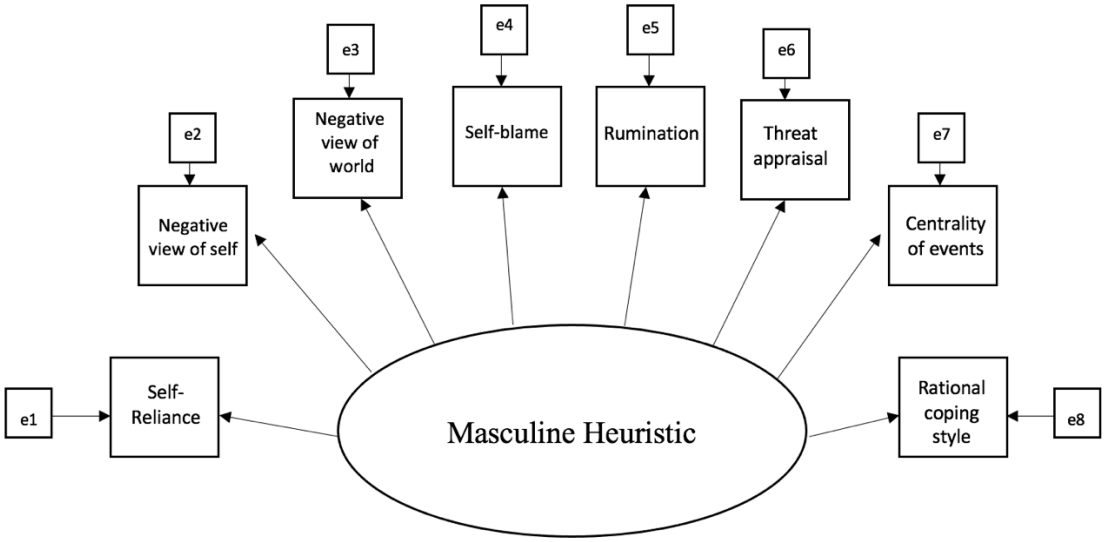


Figure 3

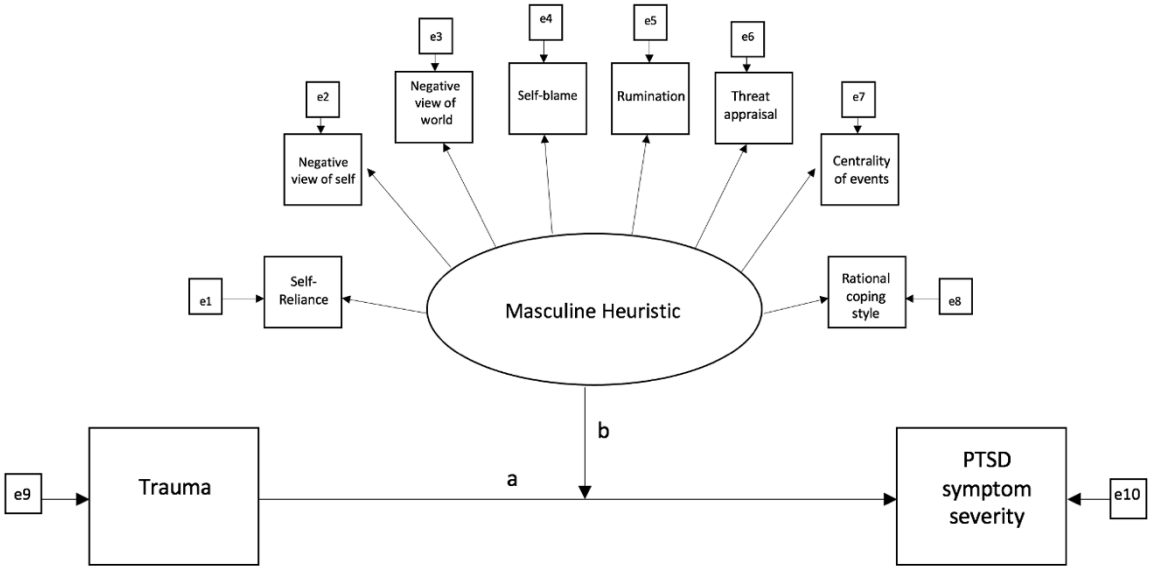


Figure 4
CFA Measurement Model

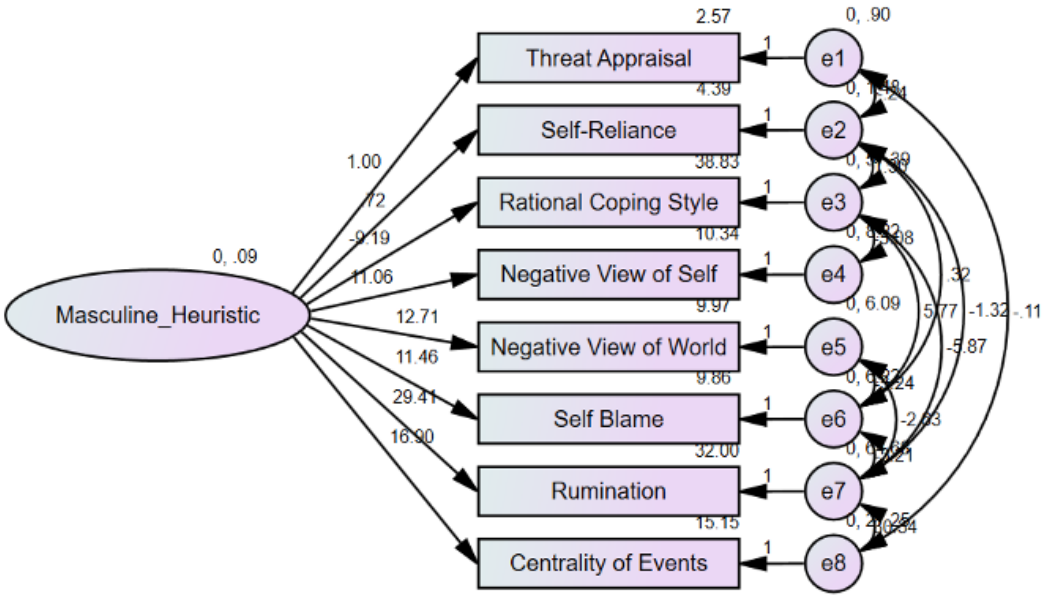


Figure 5
Overall SEM Model

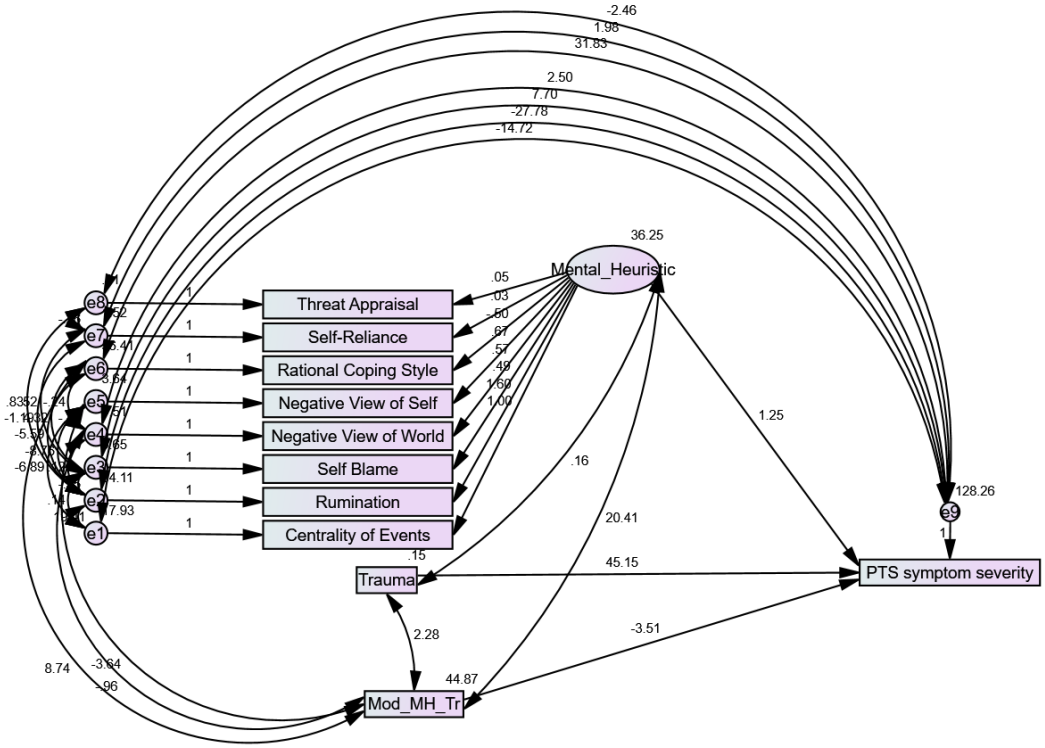


Figure 6
Moderation Simple Slopes

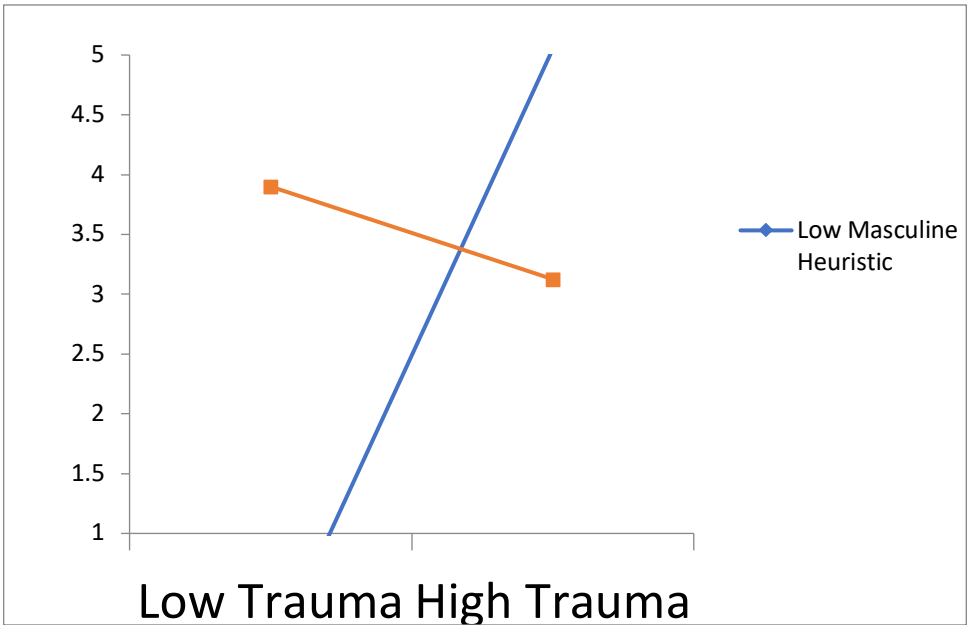


Figure 7
Multigroup SEM Model (Male)

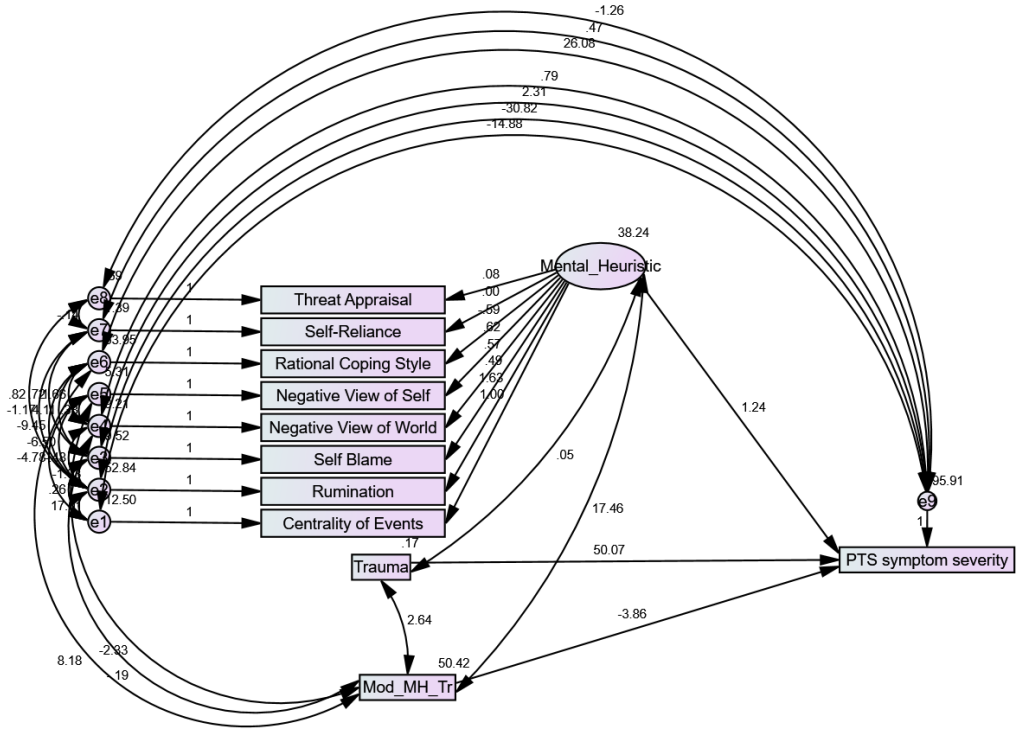


Figure 8
Multigroup SEM Model (Female)

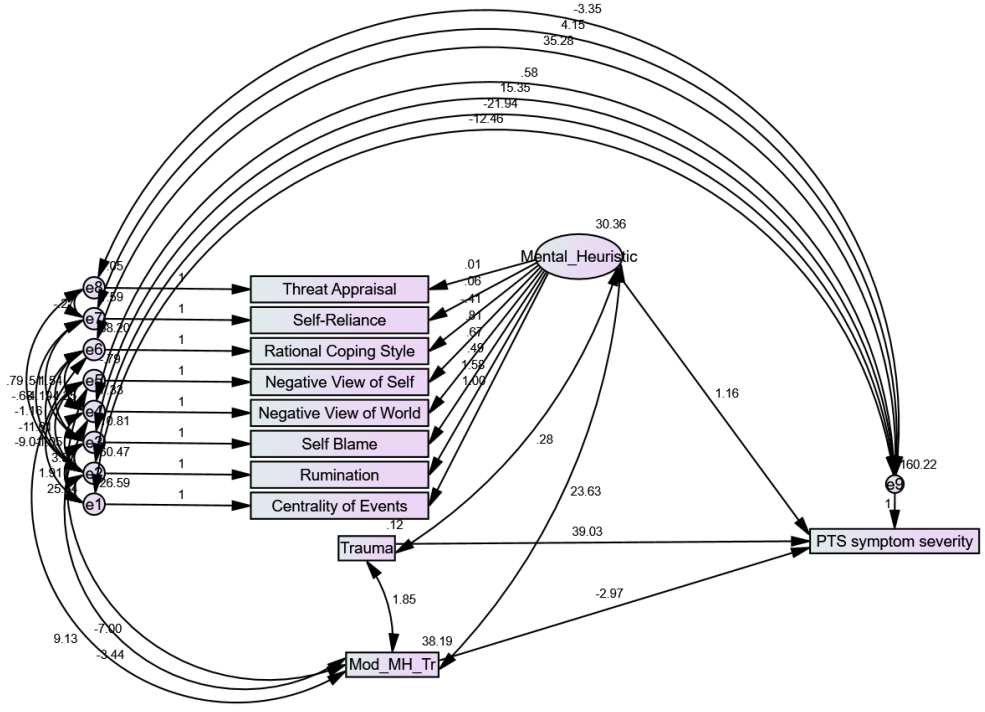
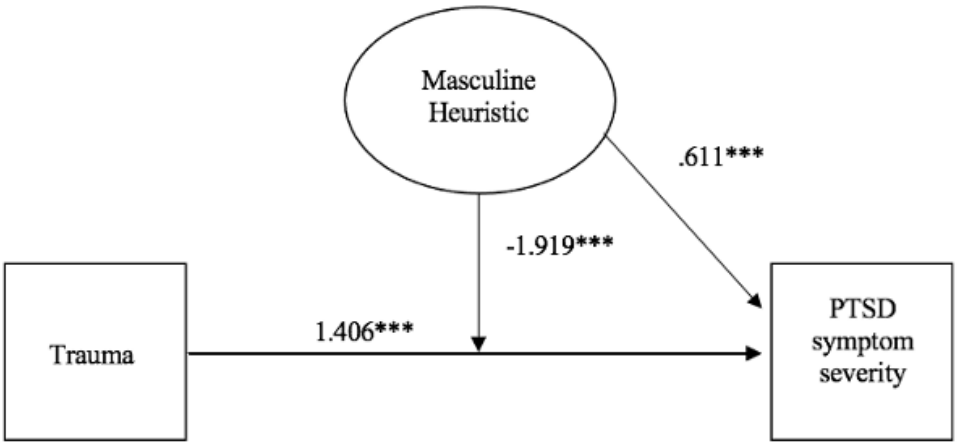


Figure 9
Final Moderation Model



Final moderation model. Parameter estimates represent standardized regression coefficients. ***p < .001

CHAPTER 7

TABLES

Table 1

Descriptive Statistics and Intercorrelations for Study Variables

	1	2	3	4	5	6	7	8	9	10
1. LEC										
2. PCL	-.178**									
3. Threat Appraisal	-.192**	-.237**								
4. CMNI	0.057	.116*	-.154**							
5. CSQ	0.045	0.088	-0.104	0.062						
6. PTCI - Self	0.104	-0.005	.251**	.155**	-.348**					
7. PTCI - World	-0.008	-0.069	.226**	.164**	-.281**	.654**				
8. PTCI – Self Blame	.123*	-0.064	.247**	.206**	-.131*	.627**	.533**			
9. PTQ	0.030	-.407**	.319**	0.004	-.349**	.547**	.582**	.543**		
10. CES	-0.003	-.383**	.268**	0.079	-.288**	.521**	.599**	.570**	.869**	
11. Masculine Heuristic	0.058	-.290**	.338**	.170**	-0.064	.683**	.728**	.740**	.879**	.878**

Note: PCL-5 = PTSD Checklist, CMNI = Conformity to Masculine Norms Inventory, CSQ = Coping Styles Questionnaire, PTCI = Post-Trauma Cognitions Inventory, CES = Centrality of Events Scale, PTQ = Perseverative Thinking Questionnaire.

Values below diagonal line represent Intercorrelations of observed scale scores. *p < .05, **p < .01

Table 2

Convergent and Discriminant Validity

Factor	Items	SMC	SFL	CA	CR	AVE	FL	Sqrt AVE
Masculine Heuristic	Centrality of Events	0.498	0.706***	0.617	0.774	0.409	0.64	0.639531
	Rumination	0.559	0.748***					
	Self-Blame	0.667	0.817***					
	Negative View of the World	0.715	0.846***					
	Negative View of Self	0.585	0.765***					
	Rational Coping Style	0.122	-0.35***					
	Self-Reliance	0.032	0.18*					
	Threat Appraisal	0.095	0.309***					

Note: SMC=Squared Multiple Correlations, SFL=Standardized Factor Loadings, CA=Cronbach's Alpha, CR=Composite Reliability, AVE=Average Variance Extracted, FL=Fornel Lacker Criteria.

Table 3
Measurement Model Fit Indices

Measure	**Estimate**	**Threshold**	**Interpretation**
CMIN	11.103	--	--
DF	8.000	--	--
CMIN /DF	1.388	Between 1 and 3	Excellent
CFI	0.997	>0.95	Excellent
SRMR	0.028	<0.08	Excellent
RMSEA	0.036	<0.06	Excellent
PClose	0.642	>0.05	Excellent
IFI	0.997	>0.95	Excellent
TLI	0.990	>0.95	Excellent

Table 4
Overall Structural Model Results

Relationship	β Estimate	*t* statistic	*p*	Results
Trauma → PCL	1.406	4.522	.000	Significant
Masculine Heuristic → PCL	0.611	3.853	.000	Significant
Trauma * Masculine Heuristic → PCL	-1.919	-5.390	.000	Significant

Table 5
SEM Model Fit Measures (Unconstrained Model)

Measure	**Estimate**	**Threshold**	**Interpretation**
CMIN	40.738	--	--
DF	17.000	--	--
CMIN/DF	2.396	Between 1 and 3	Excellent
CFI	0.990	>0.95	Excellent
SRMR	0.053	<0.08	Excellent
RMSEA	0.068	<0.06	Acceptable
PClose	0.127	>0.05	Excellent
IFI	0.990	>0.95	Excellent
TLI	0.967	>0.95	Excellent
GFI	0.978	>0.95	Excellent
AGFI	0.913	>0.80	Excellent

Table 6
Multigroup Modeling

Path Name	Male Beta	Female Beta	Interpretation
Trauma → PCL	1.718***	1.088**	There is no difference
MH → PCL	0.644***	0.513**	There is no difference
Mod_MH_Tr → PTCL	-2.302***	-1.475**	There is no difference

Table 7
SEM Model Fit Measures (Constrained Model)

Measure	Multigroup Models	Threshold	Interpretation
CMIN	59.137	--	--
DF	34	--	--
CMIN/DF	1.740	Between 1 and 3	Excellent
CFI	0.990	>0.95	Excellent
SRMR	0.050	<0.08	Excellent
RMSEA	0.049	<0.06	Excellent
PClose	0.496	>0.05	Excellent
IFI	0.990	>0.95	Excellent
TLI	0.966	>0.95	Excellent
GFI	0.967	>0.95	Excellent
AGFI	0.871	>0.80	Excellent

Table 8
Global Test

	X^2	DF
Unconstrained	59.173	34
Constrained	59.965	36
Difference	0.792	2
P-Value	0.673	

Interpretation: The p-value of the chi-square difference test is not significant; interpret local tests with caution

CHAPTER 8

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Appendix A: Life Events Checklist

LEC-5 Standard

Instructions: Listed below are a number of difficult or stressful things that sometimes happen to people. For each event check one or more of the boxes to the right to indicate that: (a) it happened to you personally; (b) you witnessed it happen to someone else; (c) you learned about it happening to a close family member or close friend; (d) you were exposed to it as part of your job (for example, paramedic, police, military, or other first responder); (e) you're not sure if it fits; or (f) it doesn't apply to you.

Be sure to consider your *entire life* (growing up as well as adulthood) as you go through the list of events.

Event	Happened to me	Witnessed it	Learned about it	Part of my job	Not sure	Doesn't apply
1. Natural disaster (for example, flood, hurricane, tornado, earthquake)	☐	☐	☐	☐	☐	☐
2. Fire or explosion	☐	☐	☐	☐	☐	☐
3. Transportation accident (for example, car accident, boat accident, train wreck, plane crash)	☐	☐	☐	☐	☐	☐
4. Serious accident at work, home, or during recreational activity	☐	☐	☐	☐	☐	☐
5. Exposure to toxic substance (for example, dangerous chemicals, radiation)	☐	☐	☐	☐	☐	☐
6. Physical assault (for example, being attacked, hit, slapped, kicked, beaten up)	☐	☐	☐	☐	☐	☐
7. Assault with a weapon (for example, being shot, stabbed, threatened with a knife, gun, bomb)	☐	☐	☐	☐	☐	☐
8. Sexual assault (rape, attempted rape, made to perform any type of sexual act through force or threat of harm)	☐	☐	☐	☐	☐	☐
9. Other unwanted or uncomfortable sexual experience	☐	☐	☐	☐	☐	☐
10. Combat or exposure to a war-zone (in the military or as a civilian)	☐	☐	☐	☐	☐	☐
11. Captivity (for example, being kidnapped, abducted, held hostage, prisoner of war)	☐	☐	☐	☐	☐	☐
12. Life-threatening illness or injury	☐	☐	☐	☐	☐	☐
13. Severe human suffering	☐	☐	☐	☐	☐	☐
14. Sudden violent death (for example, homicide, suicide)	☐	☐	☐	☐	☐	☐
15. Sudden accidental death	☐	☐	☐	☐	☐	☐
16. Serious injury, harm, or death you caused to someone else	☐	☐	☐	☐	☐	☐
17. Any other very stressful event or experience	☐	☐	☐	☐	☐	☐

Appendix B: PTSD Checklist for DSM-V

PCL-5

Instructions: Below is a list of problems that people sometimes have in response to a very stressful experience. Please read each problem carefully and then circle one of the numbers to the right to indicate how much you have been bothered by that problem in the past month.

In the past month, how much were you bothered by:	Not at all	A little bit	Moderately	Quite a bit	Extremely
1. Repeated, disturbing, and unwanted memories of the stressful experience?	0	1	2	3	4
2. Repeated, disturbing dreams of the stressful experience?	0	1	2	3	4
3. Suddenly feeling or acting as if the stressful experience were actually happening again (as if you were actually back there reliving it)?	0	1	2	3	4
4. Feeling very upset when something reminded you of the stressful experience?	0	1	2	3	4
5. Having strong physical reactions when something reminded you of the stressful experience (for example, heart pounding, trouble breathing, sweating)?	0	1	2	3	4
6. Avoiding memories, thoughts, or feelings related to the stressful experience?	0	1	2	3	4
7. Avoiding external reminders of the stressful experience (for example, people, places, conversations, activities, objects, or situations)?	0	1	2	3	4
8. Trouble remembering important parts of the stressful experience?	0	1	2	3	4
9. Having strong negative beliefs about yourself, other people, or the world (for example, having thoughts such as: I am bad, there is something seriously wrong with me, no one can be trusted, the world is completely dangerous)?	0	1	2	3	4
10. Blaming yourself or someone else for the stressful experience or what happened after it?	0	1	2	3	4
11. Having strong negative feelings such as fear, horror, anger, guilt, or shame?	0	1	2	3	4
12. Loss of interest in activities that you used to enjoy?	0	1	2	3	4
13. Feeling distant or cut off from other people?	0	1	2	3	4
14. Trouble experiencing positive feelings (for example, being unable to feel happiness or have loving feelings for people close to you)?	0	1	2	3	4
15. Irritable behavior, angry outbursts, or acting aggressively?	0	1	2	3	4
16. Taking too many risks or doing things that could cause you harm?	0	1	2	3	4
17. Being "superalert" or watchful or on guard?	0	1	2	3	4
18. Feeling jumpy or easily startled?	0	1	2	3	4
19. Having difficulty concentrating?	0	1	2	3	4
20. Trouble falling or staying asleep?	0	1	2	3	4

Appendix C: Conformity to Male Norms Inventory-30

Thinking about your own actions, feeling and beliefs, please indicate how much you personally agree or disagree with each statement by circling SD for "Strongly Disagree", D for "Disagree", A for "Agree" and SA for "Strongly Agree". There are no right or wrong answers and it is best if you respond with your first impression when answering.

1.	I will do anything to win	SD	D	A	SA
2.	I would change sexual partners often if I could	SD	D	A	SA
3.	In general I must get my way	SD	D	A	SA
4.	I think that trying to be important is a waste of time	SD	D	A	SA
5.	I enjoy taking risks	SD	D	A	SA
6.	I dislike any kind of violence (R)	SD	D	A	SA
7.	I would hate to be important (R)	SD	D	A	SA
8.	I bring up my feelings when talking to others (R)	SD	D	A	SA
9.	I would be furious if someone thought I was gay	SD	D	A	SA
10.	I take risks	SD	D	A	SA
11.	I think that violence is sometimes necessary	SD	D	A	SA
12.	I would feel good if I had many sexual partners	SD	D	A	SA
13.	It would be awful if people thought I was gay	SD	D	A	SA
14.	I like to talk about my feelings (R)	SD	D	A	SA
15.	I never ask for help*	SD	D	A	SA
16.	Having status is not important to me (R)	SD	D	A	SA
17.	I put myself in risky situations	SD	D	A	SA
18.	The women in my life should obey me	SD	D	A	SA
19.	I feel good when work is my first priority	SD	D	A	SA
20.	It's never ok for me to be violent (R)	SD	D	A	SA
21.	I would find it enjoyable to date more than one person at a time	SD	D	A	SA
22.	I would get angry if people thought I was gay	SD	D	A	SA
23.	I am not ashamed to ask for help (R)*	SD	D	A	SA
24.	For me, the best feeling in the world comes from winning	SD	D	A	SA
25.	Work comes first for me	SD	D	A	SA
26.	I tend to share my feelings (R)	SD	D	A	SA
27.	Things tend to be better when men are in charge	SD	D	A	SA
28.	I need to prioritize my work over other things	SD	D	A	SA
29.	It bothers me when I have to ask for help*	SD	D	A	SA
30.	I love it when men are in change of women	SD	D	A	SA

Items are coded as SD = 0 to SA = 3. **Items with (R) are reverse coded. Items with * comprise Self-reliance subscale**

Appendix D: Centrality of Events Scale

The Centrality of Events Scale (CES)

Please think back upon the most stressful or traumatic event in your life and answer the following questions in an honest and sincere way, by circling a number from 1 to 5.

1 Totally disagree	2	3	4	5 Totally agree

1. I feel that this event has become part of my identity. 1 2 3 4 5
2. This event has become a reference point for the way I understand myself and the world. 1 2 3 4 5
3. I feel that this event has become a central part of my life story. 1 2 3 4 5
4. This event has colored the way I think and feel about other experiences. 1 2 3 4 5
5. This event permanently changed my life 1 2 3 4 5
6. I often think about the effects this event will have on my future. 1 2 3 4 5
7. This event was a turning point in my life. 1 2 3 4 5

Appendix E: The Posttraumatic Cognitions Inventory – 9 Item

The Posttraumatic Cognitions Inventory – 9 Item (PTCI-9)

We are interested in the kind of thoughts which you may have had after a traumatic experience. Below are a number of statements that may or may not be representative of your thinking. Please read each statement carefully and tell us how much you AGREE or DISAGREE with each statement. People react to traumatic events in many different ways. There are no right or wrong answers to these statements. Circle the number that best corresponds to you answer

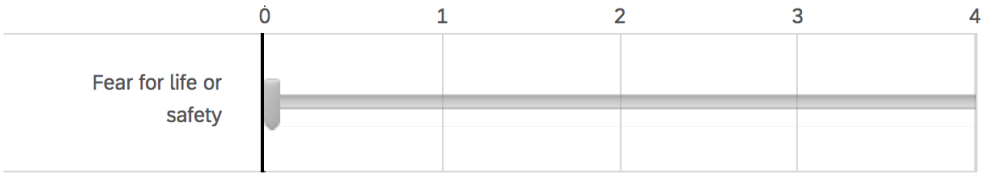
Totally Disagree	Disagree very much	Disagree slightly	Neutral	Agree sightly	Agree very much	Totally Agree
1	2	3	4	5	6	7

1. The event happened because of the way I acted. 1 2 3 4 5 6 7
2. People can't be trusted. 1 2 3 4 5 6 7
3. Somebody else would not have gotten into this situation. 1 2 3 4 5 6 7
4. I can't rely on other people. 1 2 3 4 5 6 7
5. I have no future. 1 2 3 4 5 6 7
6. People are not what they seem. 1 2 3 4 5 6 7
7. There is something about me that made the event happen. 1 2 3 4 5 6 7
8. I feel like I don't know myself anymore. 1 2 3 4 5 6 7
9. Nothing good can happen to me anymore. 1 2 3 4 5 6 7

Appendix F: Perceived Life Threat

Perceived Life Threat

Please rate the degree to which you feared for your life or safety during the stressful event(s) you have experienced from 0 (not at all) to 4 (very strongly).



Appendix G: Perseverative Thinking Questionnaire

Perseverative Thinking Questionnaire

Instructions: In this questionnaire, you will be asked to describe how you *typically* think about negative experiences or problems. Please read the following statements and rate the extent to which they apply to you when you think about negative experiences or problems.

		never	rarely	sometimes	often	almost always
1.	The same thoughts keep going through my mind again and again.	0	1	2	3	4
2.	Thoughts intrude into my mind.	0	1	2	3	4
3.	I can't stop dwelling on them.	0	1	2	3	4
4.	I think about many problems without solving any of them.	0	1	2	3	4
5.	I can't do anything else while thinking about my problems.	0	1	2	3	4
6.	My thoughts repeat themselves.	0	1	2	3	4
7.	Thoughts come to my mind without me wanting them to.	0	1	2	3	4
8.	I get stuck on certain issues and can't move on.	0	1	2	3	4
9.	I keep asking myself questions without finding an answer.	0	1	2	3	4
10.	My thoughts prevent me from focusing on other things.	0	1	2	3	4
11.	I keep thinking about the same issue all the time.	0	1	2	3	4
12.	Thoughts just pop into my mind.	0	1	2	3	4
13.	I feel driven to continue dwelling on the same issue.	0	1	2	3	4
14.	My thoughts are not much help to me.	0	1	2	3	4
15.	My thoughts take up all my attention.	0	1	2	3	4

Appendix H: Coping Styles Questionnaire

Coping Styles Questionnaire (CSQ)

Instructions: Although people may react in different ways to different situations, we all tend to have a characteristic way of dealing with things that upset us. How would you describe the way you *typically* react to stress?

1. Feel overpowered and at the mercy of the situation.	A	O	S	N
*2. Work out a plan for dealing with what has happened.	A	O	S	N
3. See the situation for what it actually is and nothing more.	A	O	S	N
4. See the problem as something separate from myself so I can deal with it.	A	O	S	N
5. Become miserable or depressed.	A	O	S	N
6. Feel that no-one understands.	A	O	S	N
7. Stop doing hobbies or interests.	A	O	S	N
8. Do not see the problem or situation as a threat.	A	O	S	N
*9. Try to find the positive side to the situation.	A	O	S	N
10. Become lonely or isolated.	A	O	S	N
11. Daydream about times in the past when things were better.	A	O	S	N
*12. Take action to change things.	A	O	S	N
13. Have presence of mind when dealing with the problem or circumstances.	A	O	S	N
14. Avoid family or friends in general.	A	O	S	N
15. Feel helpless - there's nothing you can do about it.	A	O	S	N
*16. Try to find out more information to help make a decision about things.	A	O	S	N
17. Keep things to myself and not let others know how bad things are for me.	A	O	S	N
*18. Think about how someone I respect would handle the situation and try to do the same.	A	O	S	N
19. Feel independent of the circumstances.	A	O	S	N
20. Sit tight and hope it all goes away.	A	O	S	N
21. Take my frustrations out on the people closest to me.	A	O	S	N
22. 'Distance' myself so I don't have to make any decision about the situation.	A	O	S	N
23. Resolve the issue by not becoming identified with it.	A	O	S	N
*24. Assess myself or the problem without getting emotional.	A	O	S	N
25. Cry, or feel like crying.	A	O	S	N
*26. Try to see things from the other person's point of view.	A	O	S	N
27. Respond neutrally to the problem.	A	O	S	N

28. Pretend there's nothing the matter, even if people ask what's bothering me.	A	O	S	N
29. Get things into proportion - nothing is really that important.	A	O	S	N
*30. Keep reminding myself about the good things about myself.	A	O	S	N
31. Feel that time will sort things out.	A	O	S	N
32. Feel completely clear-headed about the whole thing.	A	O	S	N
33. Try to keep a sense of humour - laugh at myself or the situation.	A	O	S	N
34. Keep thinking it over in the hope that it will go away.	A	O	S	N
*35. Believe that I can cope with most things with the minimum of fuss.	A	O	S	N
*36. Try not to let my heart rule my head.	A	O	S	N
37. Eat more (or less) than usual.	A	O	S	N
38. Daydream about things getting better in future.	A	O	S	N
*39. Try to find a logical way of explaining the problem.	A	O	S	N
40. Decide it's useless to get upset and just get on with things.	A	O	S	N
41. Feel worthless and unimportant.	A	O	S	N
42. Trust in fate - that things have a way of working out for the best.	A	O	S	N
*43. Use my past experience to try to deal with the situation.	A	O	S	N
44. Try to forget the whole thing.	A	O	S	N
45. Just take nothing personally.	A	O	S	N
46. Become irritable or angry.	A	O	S	N
*47. Just give the situation my full attention.	A	O	S	N
*48. Just take one step at a time.	A	O	S	N
49. Criticise or blame myself.	A	O	S	N
50. Simply and quickly disregard all irrelevant information.	A	O	S	N
51. Pray that things will just change.	A	O	S	N
52. Think or talk about the problem as if it did not belong to me.	A	O	S	N
53. Talk about it as little as possible.	A	O	S	N
54. Prepare myself for the worst possible outcome.	A	O	S	N
55. Feel completely calm in the face of any adversity.	A	O	S	N
56. Look for sympathy and understanding from people.	A	O	S	N
*57. See the thing as a challenge that must be met.	A	O	S	N
*58. Be realistic in my approach to the situation.	A	O	S	N
59. Try to think about or do something else.	A	O	S	N
60. Do something that will make me feel better.	A	O	S	N

Items with * comprise Rational Coping subscale

Appendix I: Consent Form

University of Wisconsin – Milwaukee
Consent to Participate in Online Survey Research Using Qualtrics

Study Title: "Masculinity" as Moderator of PTSD Symptoms

Person(s) Responsible for Research:

Stephen Wester, Ph.D.
Principle Investigator
Professor of Counseling Psychology
Department of Educational Psychology
University of Wisconsin—Milwaukee

Kirsten Kjar, M.S.
Student Principal Investigator
Doctoral Student in Counseling Psychology
Department of Educational Psychology
University of Wisconsin—Milwaukee

Study Description: The purpose of this research study is to explore how gender socialization influences individuals' perceptions of and reactions to potentially traumatic events. Approximately 800 participants will participate in this study. If you agree to participate, you will be asked to complete an online survey that will take **approximately 20 minutes to complete**. The questions will ask about experiences of trauma, typical coping mechanisms, and attitudes, beliefs, and behaviors associated with gender roles.

Risks / Benefits: Risks to participants are considered minimal. Questions in this study may ask for personal and/or upsetting information regarding whether or not you have experienced potentially traumatic events, as well as your reactions to those events. This survey does not ask for details of these events. Resources are provided below should any of the questions in this survey be distressing. The principal investigators may also be contacted for any specific questions or resources. **A reminder that as a participant, you have the right to withdraw from this study at any time with no penalty.**

Collection of data and survey responses using the internet involves the same risks that a person would encounter in everyday use of the internet, such as breach of confidentiality. While the researchers have taken every reasonable step to protect your confidentiality, there is always the possibility of interception or hacking of the data by third parties that is not under the control of the research team. There will be no costs for participating. Benefits of participating include entry into a drawing for **a $25 Visa gift card, 8 winners will be selected**. **The benefits also include facilitating a better understanding of the development of PTSD symptoms that may allow for more effective tailoring of interventions.**

Limits to Confidentiality: Researchers will have access to your email address which may be able to be linked to some of your personal information. Emails will not be shared with anyone and will be used solely for the purposes of distributing compensation. Email addresses will be collected separately from the dataset, thus will not be connected to survey responses. Data will be retained on the Qualtrics servers for seven years and will be deleted by the research staff after this time. However, data may exist on backups or server logs beyond the timeframe of this research project.

Data transferred from the survey site will be saved in an encrypted file on a password protected computer for seven years. Only Dr. Stephen Wester and Kirsten Kjar will have access to the data collected by this study, and any reports which are generated from the data, such as publications and presentations, will only be in the form of summary statistics. Data collected will NOT be used for any future research beyond the current study. However, the Institutional Review Board at UW-Milwaukee or appropriate federal agencies like the Office for Human Research Protections may review this study's records. All study results will be reported without email addresses or other identifying information so that no one viewing the results will ever be able to match you with your responses.

Voluntary Participation: **Your participation in this study is voluntary. You may choose to not answer any of the questions or withdraw from this study at any time without penalty**. Your decision will not change any present or future relationship with the University of Wisconsin Milwaukee.

Who do I contact for questions about the study: For more information about the study or study procedures, contact Dr. Stephen Wester at srwester@uwm.edu or Kirsten Kjar at klkjar@uwm.edu.

Who do I contact for questions about my rights or complaints towards my treatment as a research subject? Contact the UWM IRB at 414-662-3544 or irbinfo@uwm.edu.

Research Subject's Consent to Participate in Research:
By entering this survey, you are indicating that you have read the consent form, you are age 18 or older and that you voluntarily agree to participate in this research study. Please make sure that you have read and agree to Qualtrics' participant and privacy agreements as these may impact the disclosure and use of your personal information.

Thank you!

SAMHSA's National Helpline
Phone: 800-662-4357
Hours: 24/7

NAMI HelpLine
Phone: 800-950-6264
Hours: M-F, 10 a.m. - 6 p.m. ET