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The Relationship between Posttraumatic Cognitions and Social Support in the Severity of PTSD Symptoms

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THE RELATIONSHIP BETWEEN POSTTRAUMATIC COGNITIONS AND SOCIAL
SUPPORT IN THE SEVERITY OF PTSD SYMPTOMS

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Abstract

Exposure to a traumatic event is relatively common, but the development of posttraumatic stress disorder (PTSD) is the outcome for only a portion of the individuals who suffer this experience. Etiology models that examine a wide range of factors including environmental, personal, social, and trauma-specific variables relevant to the development of PTSD have been established. Within these models, posttraumatic cognitions and social support have been identified as particularly salient aspects of the posttraumatic adaptation process. Although the independent associations of posttraumatic cognitions, perceived availability of social support and self-reported received social support have been recognized in theoretical etiology models and empirical research, much less is known about the way these variables interact in the development of PTSD. The current research tested the association between the perceived availability of social support and self-reported received social support in an interpersonal trauma sample ($n=472$). Results indicate that socially supportive behavior accounts for 25% ($R^2=.25$) of the variance in perceived availability of social support. Mean levels of perceived availability of social support and self-reported received social support were compared for the sample meeting diagnostic criteria for PTSD ($n=204$) to the sample endorsing subthreshold PTSD symptoms ($n=268$). In the PTSD-positive sample, socially supportive behavior accounted for 40% ($R^2=.40$) of the variance in perceived availability of social support. In the PTSD-negative sample, socially supportive behavior accounted for 16% ($R^2=.16$) of the variance in perceived availability of social support. Furthermore, the relationship between received social support and perceived availability of social support was significantly stronger in the PTSD-positive sample ($Z=3.40$, p (*one-tailed*) $<.001$).

COGNITIONS, SOCIAL SUPPORT, AND TRAUMA

Subjects meeting criteria for PTSD reported significantly higher levels of perceived availability of social support ($F(1,470) = 51.045, p < .001, \text{partial } \eta^2 = .098$), but differences in level of received support were non-significant. Finally, results of the SEM model demonstrate that levels of posttraumatic cognitions, perceived availability of social support, and self-reported received social support accounted for 58% of the variance in PTSD symptoms ($R^2 = .58$) and further clarify complex relationships between these variables.

The Relationship between Posttraumatic Cognitions and Social Support in the Severity of
PTSD Symptoms

Research suggests that lifetime exposure to a traumatic event is relatively common. In a large scale epidemiological study including a nationally representative sample of 5,877 persons, 60.7% of women and 51.2% of men reported exposure to at least one traumatic event (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). Experiencing some degree of psychological distress that diminishes over time following a trauma is also common and somewhat expected (Bryant, 2003; Foa & Riggs, 1995). Prospective research assessing the course of symptoms after exposure to a traumatic event has shown that symptoms dramatically decrease over time for most individuals, particularly within the first one to three months (e.g. Gutner, Rizvi, Monson, & Resick, 2006; Riggs, Rothbaum, & Foa, 1995; Rothbaum, Foa, Riggs, Murdock, & Walsh, 1992). Therefore, experiencing some degree of distress following a trauma is normative, but the severity and chronicity of the distress can vary.

A segment of individuals who experience a traumatic event continue to endure psychological difficulty and may develop posttraumatic stress disorder (PTSD). The diagnosis of PTSD describes a range of symptomatology suffered in the wake of experiencing a traumatic event. To qualify as a traumatic event according to the Diagnostic and Statistical Manual 4th Edition (DSM-IV-TR), stressors must involve “actual or threatened death or serious injury, or a threat to the physical integrity of self or others” (American Psychiatric Association [APA], 2000, p. 467; Criterion A1). Additionally, the person’s response to the event must include significant fear, helplessness, or horror (APA, 2000; Criterion A2). These criteria defining a “Criterion

A” event and a person’s response to the event provide an important basis for distinguishing clinically-defined “traumatic events” from the myriad of stressors that may occur.

Following the event, the trauma-exposed individual must continue to experience symptoms that fall into each of three categories to qualify for a diagnosis of PTSD. The first category includes symptoms related to reexperiencing the traumatic event (intrusive recollections, distressing dreams, feeling as if the event were reoccurring, psychological distress, and physiological reactivity in response to reminders of the trauma; Criterion B). The second cluster of symptoms includes avoiding reminders of the traumatic event (avoiding thoughts, people, places, and activities associated with the trauma, difficulty recalling important details from the trauma, diminished interest in activities, restricted range of affect, feelings of detachment, sense of foreshortened future; Criterion C). The third cluster of symptoms describes hyperarousal symptoms which remain elevated following the traumatic event (difficulty with sleep, concentration, irritability, feeling hypervigilant, exaggerated startle response; Criterion D). To meet diagnostic criteria for PTSD, the trauma survivor must endure these symptoms for a period of a month or more (Criterion E) and experience clinically significant distress or interference in functioning due to their presence (Criterion F). As indicated by the specifiers listed in the DSM-IV, PTSD can take on an acute (symptoms lasting 3 months or less) or chronic (symptoms lasting 3 months or more) course. The lifetime prevalence estimate for PTSD in the U.S. population using DSM-IV criteria is 6.8% based on a nationally representative sample of 9,282 people (Kessler, Berglund, Demler, Jin & Walters, 2005).

Research investigating the psychological sequelae that occur following exposure to a traumatic event indicate that the development of PTSD is the outcome for only a small percentage of individuals. An epidemiological study conducted by Breslau et al. (1998) that studied a representative sample of 2,181 individuals concluded that the conditional probability of developing PTSD following exposure to a traumatic event was 9.2%. The discrepancy between the large percentage of people that experience traumatic events compared to the minority that develop PTSD indicates that circumstances beyond exposure to a traumatic event must determine risk and resiliency for this disorder.

Specific demographic factors may play a role in determining risk for exposure to a traumatic event as well as the likelihood for developing PTSD. In particular, gender is a variable that has been shown to confer differential risk and resiliency for PTSD. The epidemiological study previously mentioned by Kessler et al. (1995) concluded that a larger percentage of men (60%) compared to women (51%) endorse lifetime exposure to any type of traumatic event. Men are also more likely to experience specific types of trauma, with the exception of rape, molestation, childhood neglect, and physical abuse. In contrast, women are more than twice as likely as men to develop lifetime PTSD (10.4% vs. 5.0%; Kessler et al., 1995). Consistent with those results, a meta-analysis conducted by Tolin and Foa (2008) also concluded that women are more likely than men to develop PTSD and less likely to experience most types of trauma, with the exception of sexual assault and childhood sexual abuse. In conclusion, current research suggests that although men are at greater risk for experiencing most types of traumatic events, women appear more at risk for developing PTSD.

Culture and ethnicity are also important demographic factors to consider in relation to traumatic event exposure and development of PTSD. The literature on the relationship between ethnicity, exposure to trauma, and the development of PTSD has yielded mixed findings. A large scale epidemiology study ($n=1,000$) found that Caucasian Americans were significantly more likely to be exposed to a traumatic event compared to African Americans (Norris, 1992). In two different studies that controlled for level of combat exposure and several other predisposing factors, Hispanic veterans were significantly more likely than Caucasian veterans to meet diagnostic criteria for PTSD (Kulka et al., 1990) and veterans of Japanese ancestry were significantly less likely to meet criteria for PTSD than Caucasian veterans (Friedman, Schnurr, Sengupta, Holmes, & Ashcraft, 2004). In contrast, another large epidemiology study found there was no significant association between race or ethnicity and lifetime PTSD (Kessler et al., 1995) when controlling for other important predictors. Further replication of these studies that control for a consistent set of variables with a variety of samples and trauma types may be an important step in determining consistent relationships between ethnicity, race, risk for trauma exposure and PTSD.

In addition to these basic demographic variables, a wide range of other factors that are specific to the individual must also be considered to understand posttraumatic reactions. The Integrative Psychosocial Model (Joseph, Williams, & Yule, 1997; Williams & Joseph, 1999) describes a comprehensive etiology model highlighting the ways that environmental, personal, and social factors are related to the posttraumatic adaptation process. The model states that following exposure to a traumatic event, an individual develops event cognitions; conscious as well as non-conscious representations

of the experience. Event cognitions are specific to the individual as they are determined by unique factors such as prior experience and personality. Event cognitions influence the formation of later cognitive appraisals of the traumatic event and life experiences in general. Personality factors including cognitive schema and assumptions interact with event cognitions and form a reciprocal relationship with appraisal mechanisms. The cognitive chain of events following exposure to a traumatic event including event cognitions and appraisal mechanisms will lead to the development of strong emotional states such as fear, panic, grief, guilt, and shame. These emotions in turn can affect the development of future cognitive appraisals and necessitate the onset of avoidant and active coping strategies. An integral component of this coping model is the process of seeking support from one's social support network. The nature and content of this support will subsequently impact event specific and general cognitive appraisals made by the individual to aid in positive coping or induce more distress. Therefore, this model highlights the significant role that cognitions and social support assume in the posttraumatic adaptation process, in addition to several other factors. The specific impact that cognitions and social support have on the development of posttraumatic symptoms will be further elaborated.

Social Support

Humans instinctively have an associative and communal orientation toward others. The process of spending time and engaging in relationships with fellow humans provides companionship, support, and nurturance that is essential to development and happiness. Furthermore, the perception of having support available at times of need or stress is important to maintaining physical and psychological well being (Berkman, 2000;

Berkman, Glass, Brissette, & Seeman, 2000; Cohen & Willis, 1985; Feldman & Cohen, 2000). Lack of social support can be a risk factor for developing psychopathology as well as a consequence in response to the manifestation of certain psychological symptoms by an individual. In particular, the study of social support may have specific relevance for those who experienced traumatic events based on the role that seeking social support can play in the posttraumatic adaptation process, according to current etiology models.

The action of socializing with others and obtaining assistance and encouragement, which is formally termed as social support, can be explained and quantified in a multitude of ways. Generally speaking, social support can be defined as “the provision of assistance or comfort to others, typically in order to help them cope with a variety of biological, psychological, or social stressors” (Vanden Bos, 2007, p. 869). Social support occurs through a range of different relationships with significant other, family members, friends, and more general community level and institutional associations. It can take a variety of forms including monetary support, informational assistance, and emotional support (Vanden Bos, 2007). Considering the variety of ways that humans interact with one another, social support is best conceptualized as a multidimensional construct consisting of many different subtypes of support (Veiel, 1985). However, such complexity leads to challenges with consistent definition and measurement of these variables.

Self-reported received support and perceived availability of support have been identified as two particularly relevant sub-constructs of social support. Self-reported received support, also referred to as functional support, focuses on the transmission of supportive behaviors and actions. Wills and Shinar (2000) provided a thorough

description of different support types that may be received including emotional support, instrumental support, informational support, companionship, and validation. Assessing self-reported received social support often involves a quantitative approach to the measurement of supportive behaviors and interactions that were experienced within a specified time frame (Feldman & Cohen, 2000). Therefore, self-reported received social support is based on concrete exchanges of supportive behaviors between individuals.

In contrast, perceived availability of support is focused on the recipient's cognitive appraisal of supportive behaviors, perceptions of support availability, and determinations regarding the adequacy of support. The combination of these factors leads to a generalized composite sense of support. Some measures of perceived support ask the respondent to evaluate how support would be provided by support network members if needed while others ask for more global ratings about how supported one feels (Feldman & Cohen, 2000). The construct of perceived availability of social support captures an individual's beliefs regarding their social environment as opposed to assessing concrete interactions aimed at the provision of support (Rook & Underwood, 2000). Based on these factors, measurement of the perceived availability of support will necessarily be more subjective in nature.

The set of overlapping and independent factors that define self-reported received support and perceived availability of support create an association between these constructs but also highlight their distinction. A substantial amount of social support research has demonstrated a lack of perfect correlation between measures of perceived availability of support and self-reported received support, suggesting the processes measured by these terms represent separate constructs (Wills & Shinar, 2000). A meta-

analysis that reviewed data from 23 studies reported that the correlation between perceived availability of support and self-reported received support was $r = .35$ ($p < .001$; Haber, Cohen, Lucas, & Baltes, 2007). Results indicate that a moderate relationship between perceived availability of support and self-reported received support exists, but authors pointed to the unexplained variance which must be attributed to other factors. Additional research has failed to find a significant relationship between the level of perceived availability of support and the actual amount of received supportive behaviors (Lakey & Heller, 1988). The distinction between these sub-constructs is further substantiated by research showing that perceived availability of support and self-reported received support maintain different relationships with outcome variables such as level of distress, cognitive variables (Lakey & Cassidy, 1990) and level of adjustment (Helgeson, 1993). The unexplained variance between self-reported received support and perceived availability of support indicates a need for further research examining factors that differentially contribute to each construct.

Gender has proven to be an important demographic characteristic related to the general social support literature. Men and women seem to hold similar views regarding the meaning of social relationships and both place importance on emotional support (Burlison, 2003), but the level and significance of social support may vary by gender. Social support has evidenced a strong association with psychological health specifically in women (Flaherty & Richman, 1989) and women have been shown to experience more positive and negative social support compared to men (Turner, 1994). In a sample of college students ($N=92$), women reported significantly higher satisfaction with social support than men, despite having similar ratings for social support network size (Hughes,

2007). Based on their review of the extant literature, Schumaker and Hill (2001) observed that consistent gender differences exist in the structure and function of social support. More specifically, men experienced larger, more diffuse social networks while women had smaller networks that provided a greater variety of support types and were based on closer relationships. Although some consistent gender differences in social support appear supported by the literature, broad generalizations regarding social support based on gender may be short sighted considering the host of other demographic and sample specific factors which can also play a role.

Race and ethnicity are also demographic characteristics that may affect the perceived availability and receipt of social support. Similar to gender, conceptions of close relationships and the importance placed on emotional support have shown some key similarities across racial and ethnic groups (Burleson, 2003). However, differences in social patterns within various racial and ethnic groups such as strength of familial affiliation, migration within kin networks, strength of cultural identification, and collectivist versus individualist cultural orientations can cause variation in the level of perceived availability of support and self-reported received social support. For instance, a small but significant association was shown indicating that African Americans have smaller social support networks compared to European American and “other” ethnic groups (Asian, Hispanic, Native American) in a national probability sample of 2,264 respondents (Pugliesi & Shook, 1998). In a sample of 3,968 child caregivers primarily composed of women, foreign born Mexican Latinos reported significantly higher perceived availability of family support when compared to non-Latino whites. No significant differences were found between non-Latino whites, non-Latino blacks, Asian

and U.S. born Latinos in perceived availability of family social support (Almeida, Molnar, Kawachi, & Subramanian, 2009). In the same study, levels of perceived availability of social support from friends were significantly higher for non-Latino whites when compared to non-Latino blacks, Asian, non-Mexican and Mexican Latinos. As depicted in the summarized research, the relationships between these variables gain complexity based on the multiple factors involved including the interactions between ethnicity, race, and country of origin.

Although a great deal of research has been accomplished exploring the associations between ethnicity, race, and social support, the nuanced relationships observed in the data may prohibit researchers' ability to draw strong, universal conclusions. Additionally, Kaniasty and Norris (2000) noted that empirical research has often contradicted theoretically-based assertions regarding higher levels of cultural and family-based social support for African Americans and Latino Americans compared to European Americans, suggesting a disjuncture between the academic understanding of these cultures compared to their true social functioning. Therefore, current research has shown some evidence that racial and ethnic factors may create differences in the perceived availability and use of social support, but the pattern of these associations requires further empirical support while controlling for a standard set of other factors such as SES and native language.

Social Support Following Trauma

While social support appears to promote general physical and psychological wellbeing, the role it plays in functioning becomes more central following exposure to a traumatic event. Social support plays a crucial role in the formation of cognitions related

to the traumatic event soon after exposure. It also serves as a coping mechanism that traumatized individuals may seek out when negative cognitions specific to the traumatic event lead to distressing emotions (Joseph, Williams, & Yule, 1997; Williams & Joseph, 1999). Therefore, social support appears to intercede in the posttraumatic adaptation process in several different ways.

Empirical research has consistently validated the wide-ranging impact of social support on posttraumatic symptoms. A meta-analysis conducted by Brewin, Andrews, and Valentine (2000) examined the effect of 14 separate risk factors on the development of PTSD for individuals exposed to trauma in adulthood. Lack of posttrauma social support overwhelmingly demonstrated the largest weighted average effect size ($r = .40$) compared to other potential risk factors. Another meta-analysis by Ozer, Best, Lipsey and Weiss (2003) investigated seven prominent predictors for a diagnosis of PTSD, or its related symptoms, within the trauma literature. Perceived availability of social support again emerged as an important predictor of posttraumatic distress (weighted $r = -.28$) compared to other variables. Additionally, social support has demonstrated a longitudinal relationship with PTSD symptoms through its identification as a relevant factor in determining the level of PTSD symptom severity that initially develops as well as maintenance of the disorder after its onset (Guay, Billette, & Marchand, 2006; Schnurr, Lunney, & Sengupta, 2004). Social support has clearly proven to be a significant factor related to the onset as well as the course of PTSD.

Considering the independent associations that gender has related to trauma and social support, researchers have empirically tested the ways that these variables may interact in their effect on the development of PTSD. In a study of violent crime victims

($n=115$ male, $n=39$ female), women reported that they received significantly higher levels of negative social support from several sources, despite reporting similar levels of positive support and satisfaction with support to men (Andrews, Brewin, & Rose, 2003). Gender also moderated the relationship between negative social support and PTSD symptoms. Additional research has provided further evidence for gender differences in posttraumatic social support. Ullman and Filipas (2005) specifically examined gender differences in social support following exposure to childhood sexual abuse (CSA). In a cross-sectional convenience sample of college students ($n=520$ females, $n=213$ males), women were more likely to engage in the coping strategy of social withdrawal, which limited opportunities to receive social support. Women were also more likely to have disclosed their abuse to others and experienced significantly more positive reactions to disclosure. In contrast to Andrews et al. (2003), there were no differences in the amount of self-reported negative social reactions based on gender of the trauma survivor. However, comparisons of findings should be made with caution as the samples included different trauma types; a variable that could hold particular importance when investigating social support and gender effects.

Relationships between social support, race, and ethnicity must also be considered within the specific context of trauma. A limited amount of studies have been conducted to investigate these associations. Mueller, Orth, Wang, and Maercker (2009) compared samples of German ($n=151$) and Chinese ($n=144$) adult crime victims on PTSD symptoms, disclosure attitudes, and social acknowledgement several months post-crime. Related to disclosure attitudes, the Chinese sample showed significantly more reluctance to talk, whereas the Germans showed significantly more urge to talk about their traumatic

experience with close others. Related to social acknowledgement of the victim role, the Chinese sample evidenced significantly higher ratings of recognition while the German sample evidenced significantly higher ratings for general disapproval. Despite these cultural differences in interpersonal support variables, the variables were relatively similar in their ability to predict PTSD symptom severity. The German sample showed significantly more PTSD symptoms after controlling for other demographic and event characteristics.

Other research has found evidence for cultural differences, but no ethnic differences in the provision of social support following natural disaster. Ratings of self-reported received social support were assessed six months following exposure to Hurricane Andrew (U.S. non-Hispanic sample, $n = 270$; U.S. Hispanic sample, $n = 134$) and Paulina (Mexican sample, $n = 200$), compared with a normative sample ($n = 1,289$) representative of urban Mexico (Norris, Murphy, Kaniasty, Perilla, & Ortis, 2001). The trauma-exposed Hurricane Paulina sample reported experiencing significantly less self-reported received social support compared to the Hurricane Andrew sample, which suggested a cultural difference in the provision of support between the U.S. and Mexico following the same type of trauma. Interestingly, within the Hurricane Andrew sample there were no differences in level of self-reported received social support between the Hispanic and non-Hispanic subsamples. Therefore, the significant difference in level of self-reported received social support following exposure to a natural disaster was based on culture (U.S. versus Mexico) rather than ethnicity (Hispanic versus non-Hispanic). The conflicting nature of results between Muller et al. (2009) and Norris et al. (2001) suggests that some cultural and ethnic differences in social support and PTSD symptom

severity following exposure to trauma may exist, but the trend of these results is not yet established and requires further empirical validation.

Within the general concept of social support, the sub-constructs of perceived availability of social support and self-reported received social support are identified as being relevant to supportive transactions following exposure to trauma. However, much less is known regarding the correlation between these sub-constructs and potential differences in their relationship to psychopathology in trauma-specific social support research. Limited evidence has been found suggesting the importance of perceived availability of support over self-reported received support in terms of its ability to buffer trauma victims against negative psychological outcomes including depression and anxiety (Kaniasty & Norris, 1992), but the relationship to posttraumatic stress disorder symptoms was not tested. In a meta-analysis completed by Prati and Pietrantonio (2010), the effect size for perceived availability of social support ($r = 0.31$) was significantly higher than self-reported received social support ($r = 0.22$) on general mental health outcomes in studies of first responders. Additionally, Norris and Kaniasty (1996) found that perceived availability of support played a mediational role between self-reported received support and psychological distress. Lastly, self-reported received social support significantly predicted perceived availability of social support, which predicted quality of life in a sample of first responders (Prati & Pietrantonio, 2010 b), but again results did not speak to the impact of these variables specifically on PTSD symptoms. In conclusion, some trauma-specific research on the relationship between perceived availability and self-reported received social support and their association with psychopathology has been

accomplished, but the specific impact of these variables on PTSD symptoms in the interpersonal trauma population remains unclear.

The current lack of research exploring the relationship between perceived availability of social support, self-reported received social support, and their impact on posttraumatic symptoms in the trauma population is noteworthy for several reasons. First, the wide range of factors that could differentially impact levels of perceived availability of support and self-reported received social support, their subsequent correlation, and their relationship to PTSD symptoms in trauma survivors is unique. Specifically, the distinction between these two constructs may be especially salient for those exposed to trauma, where over-accommodated thoughts following the trauma may create a negative bias in their perception of themselves, others, and the world, resulting in decreased perceived availability of social support. The experience of interpersonal trauma may have an exceptionally negative impact on cognitions related to others. Additionally, certain PTSD symptoms (e.g. emotional numbing, hypervigilance) may cause trauma survivors to withdraw from social interactions and impair their ability to socialize effectively, leading to a decrease in the actual amount of received support in this population. More research evaluating the strength of the correlation between perceived availability of support and self-reported received support, and their association with PTSD symptom severity in interpersonal trauma survivors would be beneficial.

The Effect of Posttraumatic Cognitions on Social Support and PTSD Symptoms

After experiencing a traumatic event, individuals attempt to make sense out of their experience by developing cognitions specifically about the traumatic event.

Subsequent cognitions that appraise the meaning of the traumatic event, its future impact

on the individual, and the way that he or she functions in the world are also formed (e.g. event cognitions and appraisal cognitions; Joseph, Williams, & Yule, 1997). The cognitive sequence of events that ensues after experiencing a traumatic event is similar for all individuals, but the content may vary which can have significant bearing on the way trauma survivors adapt to their experience.

Cognitive differences in the way an individual may react to a traumatic event involve differences in appraisal of the traumatic event (and its sequelae) and differences in the way traumatic event memories resonate with other autobiographical memories (Ehlers & Clark, 2000). Event cognitions and appraisal cognitions regarding the traumatic event interact with the trauma victim's prior beliefs and experiences and can lead to changes in thoughts regarding self, world, and others. Additional cognitive themes may also be impacted by experiencing a traumatic event including safety, trust, power, esteem and intimacy (McCann & Pearlman, 1990; Resick & Schnicke, 1993). Within this process, trauma survivors that are capable of "finer discrimination of degrees of safety and competence" and can interpret the trauma as a "unique experience that does not have broad implications for the nature of the world and the nature of their ability to cope with it" (Foa, Ehlers, Clark, Tolin & Orsillo, 1999, p. 304) can more adaptively adjust to the traumatic event. However, more rigid interpretations of the traumatic event where negative prior beliefs are confirmed and strengthened by the event and prior positive beliefs regarding trust in self and the world are "shattered" by the trauma (see Foa et al., 1999; Janoff-Bulman, 1992; Resick & Schnicke, 1993) are indicative of more posttraumatic symptoms. Therefore, persistent symptoms of PTSD are more likely to occur if rigid, negative appraisal of the traumatic event creates a current sense of threat in

individuals based on their perception of the world and others as dangerous, and of themselves as incapable of negotiating challenges in life (e.g. over-accomodated thoughts; Ehlers & Clark, 2000; Foa et al., 1999; Foa & Rothbaum, 1998).

A limited amount of research has investigated differences in posttraumatic cognitions based on gender, race, and ethnicity. Daie-Gabai, Aderka, Allon-Schindel, Foa, and Gilboa-Schechtman (2011) found a significant interaction between gender and posttraumatic cognitions regarding self in predicting PTSD symptoms for males in a sample of 326 Israeli adults. Women demonstrated significantly higher values for negative posttraumatic cognitions regarding the world, but no gender differences were evidenced in posttraumatic cognitions regarding self or self-blame in a trauma exposed student sample ($n=475$; Cromer & Smyth, 2010). Finally, majority status (non-Hispanic/Latino Whites) displayed a significant interaction with cognitions in predicting anxiety symptoms in a sample of 200 students exposed to wildfire disaster (Scher & Ellwanger, 2009). As more research is conducted to clarify the relationships between gender, ethnicity, race, and posttraumatic stress disorder symptoms, such associations can be further tested with regard to posttraumatic cognitions.

Cognitions that trauma survivors develop about the traumatic event and themselves have a direct impact on PTSD symptoms, but can also affect the way they utilize other coping mechanisms related to PTSD such as social support. Negative appraisal of the traumatic event can lead to a wide range of dysfunctional behavioral and cognitive strategies (Ehlers & Clark, 2000), including avoidance of social contact based on perceived critical interpretation of the trauma survivor and his or her response to the trauma. The interpersonal schema hypothesis of revictimization describes how women

who have experienced multiple interpersonal traumas develop negative expectations of relationships including the association between relationships and harm (Cloitre, Cohen, & Scarvalone, 2002; DePrince, Combs, & Shanahan, 2009). These changes to interpersonal schemas occur as a result of modified or new cognitions about other people and social relationships based on the trauma. Lastly, it has been suggested that the experience of trauma may cause alterations in social cognition, including the perception and interpretation of social relationships and the social environment (Nietlisbach & Maercker, 2011), which may complicate interpersonal relationships. More research needs to be accomplished to further clarify the relationship between posttraumatic cognitions and their affect on social processes.

The changes in cognitions regarding self, world, others, and social relationships that occur as a result of trauma can be extrapolated to the concepts of perceived availability of social support and self-reported received support in several ways. A negative view of self following trauma could negatively impact the perception of social interactions (less perceived availability of support) and could lead to social withdrawal (less received support). A negative view of others following trauma could create a biased perception of the support that others provide (less perceived availability of support) and could negatively impact social interactions with others (e.g. hypervigilance, suspiciousness) leading to a decrease in actual received support. In conclusion, developing a strong negative view of self, others, and the world following a traumatic event will lead to less perceived availability of social support and less self-reported received social support, resulting in increased PTSD symptoms.

Summary and Study Hypotheses

Exposure to traumatic events is common, yet the conditional probability for developing PTSD following such an event is relatively small (9.2%; Breslau et al., 1998). This distinction suggests that other factors besides exposure to a traumatic event must be considered in determining psychological outcomes. Adaptation to a traumatic stressor can best be understood by evaluating the broad range of factors that contribute to the development of posttraumatic sequelae including PTSD (e.g. Joseph, Williams, & Yule, 1997; Williams & Joseph, 1999). Current etiology models and empirical research have identified posttraumatic cognitions (Foa et al., 1999) and social support (e.g. Brewin et al., 2000; Ozer et al. 2003) as independent, robust predictors of posttraumatic symptomatology. A theoretical understanding of how posttraumatic cognitions could affect social support processes also exists, but the true relationship between these constructs is not well understood. Building upon prior research, a more thorough empirical test that pulls together these central components of the etiology model for PTSD (posttraumatic cognitions and posttraumatic social support) and provides further elaboration on the interrelationship or “path” between these variables in the development and maintenance of PTSD symptoms is warranted (Keane, Marshall, & Taft, 2006). Additionally, research has been conducted to understand the relationship between perceived availability of social support and self-reported received social support. However, much of this research has been completed in student or community samples that fail to capture the changes in perceived availability and self-reported received social support that may be relevant in clinical samples, particularly those that have experienced traumatic events. More research is required to clarify the correlation between these

constructs specifically in interpersonal trauma survivors and delineate their unique relationship with posttraumatic symptoms. Based on the preceding review of relevant literature and areas that were identified as needing further empirical research, several testable hypotheses have been created.

1. It is hypothesized that there will be a positive, moderately strong correlation between perceived availability of social support and self-reported received social support in an interpersonal trauma-exposed sample.
2. An exploratory analysis will be conducted to determine whether the strength of the correlation between perceived availability of social support and self-reported received social support differs between PTSD-positive and PTSD-negative interpersonal trauma survivors. It is hypothesized that the correlation between perceived availability and self-reported received social support will be positive and stronger for those meeting criteria for PTSD. This hypothesis is based on the premise that individuals suffering from PTSD may be withdrawing from social interactions due to PTSD symptoms and thus receiving less social support. Additionally, individuals with PTSD commonly have negative posttraumatic cognitions about themselves and the world which may decrease their sense of perceived availability of social support. Therefore, it is proposed that PTSD symptoms and posttraumatic cognitions often associated with PTSD will both negatively impact levels of self-reported received social support and perceived availability of social support and strengthen their relationship.

3. It is hypothesized that levels of perceived availability of social support and self-reported received social support will be significantly lower for those meeting criteria for PTSD.
4. Lastly, this study will test a structural equation model analyzing the relationship between posttraumatic cognitions regarding self, world, and self-blame, perceived availability of social support, self-reported received social support, and PTSD symptom severity (see Figure 1.). SEM is the chosen statistical analysis for examining these variables due to its ability to identify complex patterns of relationships among a set of variables as opposed to simply defining whether a set of independent variables predict a dependent variable (Todman & Dugard, 2007). The direct effects in this model are hypothesized such that more negative posttraumatic cognitions regarding self, world, and self-blame will predict lower levels of perceived availability of social support and self-reported received social support. More negative posttraumatic cognitions regarding self, world, and self-blame are also hypothesized to directly predict greater PTSD symptoms. Finally, lower levels of perceived availability of social support and self-reported received social support are hypothesized to predict greater PTSD symptoms.

Methods

Participants

Participants were recruited through the Center for Trauma Recovery, the undergraduate subject pool at the University of Missouri-St. Louis, through the use of flyers posted in the community, and through postings on websites which allow for research study announcements. Recruitment materials called for persons that had

experienced “an upsetting or traumatic event” and instructed them to follow a link to an online survey. Participants were screened based on the following eligibility criteria: 1.) 18 years of age or older, 2.) English speaking 3.) have experienced an interpersonal trauma defined by the intentional infliction of harm by another person (Scoboria, Ford, Lin & Frisman, 2008), 4.) have experienced interpersonal trauma(s) 30 or more days prior to initiation of the survey and 5.) provide informed consent prior to participation in the study.

Based on these study recruitment methods, 1,571 individuals ($n=580$ recruited from the student subject pool; $n=991$ recruited from the community) initiated the internet-based survey at [surveymonkey.com](https://www.surveymonkey.com). Of those initially recruited, 639 cases (40.7%) successfully completed the study screening questions, consented to participate in the study, and initiated survey completion. Careful inspection of responses on the Traumatic Life Events Questionnaire (TLEQ; Kubany et al., 2000) for this sample revealed that 574 of these cases endorsed experiencing some form of interpersonal trauma, which represents the full sample for the current study. Within this sample, completion of measures throughout the survey varied greatly by case, which influenced the sample size for statistical analyses of individual hypotheses (see Figure 2. for detailed flowchart of participant attrition).

Participants in the full sample ranged in age from 18 to 80 ($M=30.29$, $SD=12.24$), and were predominantly female (78%), Caucasian (70%), and non-Hispanic (92%). The majority of the sample reported being single (55%), though 34% were married or living with a significant other. There were a range of income levels endorsed by participants with 57% of the sample earning less than \$30,000 annually, 19% earning \$30,000 to

\$50,000, and 24% earning more than \$50,000 a year. The majority of the sample characterized their level of education as partial college or less (57%), 21% reported obtaining a college degree, and 22% reported obtaining additional graduate school training beyond college. The sample was divided evenly between recruitment sources with 51% obtained from the community and 49% obtained from the student subject pool (see Table 1. for additional information).

Measures

Demographics Questionnaire (see Appendix A.). All participants completed a demographic questionnaire that included basic information on gender, age, ethnicity, educational level, marital status, employment status, occupation, and income level.

Traumatic Life Events Questionnaire (TLEQ; Kubany et al., 2000; See Appendix B.) The Traumatic Life Events Questionnaire is a 23 item self-report questionnaire that assesses exposure to 22 potentially traumatic events. The respondent is asked to specify how frequently they have experienced each event (“never” to “more than 5 times”) and the age of first and last occurrence for each event. The measure also assesses DSM-IV criteria A2 and F for each event by inquiring about whether fear, helplessness, or horror was associated with experiencing the event and the amount of distress the event currently causes (“no distress” to “extreme distress”). The TLEQ demonstrated adequate convergent validity with interview-based measures of trauma exposure (Traumatic Life Events Interview; Kubany et al., 2000). The majority of items also possessed adequate to excellent temporal stability based on kappa coefficient values with a wide variety of trauma-exposed samples.

PTSD Checklist-Civilian Version (PCL-C; Weathers, Litz, Herman, Huska, & Keane, 1993; See Appendix C). The PCL-C is a 17 item self-report measure that assesses all re-experiencing, avoidance, and hyperarousal cluster PTSD symptoms listed in the DSM-IV. Each item can be rated on a scale from 1-5 (1= “not at all”, 5= “extremely”). A total symptom severity score (range of 17-85) can be obtained by creating a sum total for all 17 item responses. The measure yielded high internal consistency ratings with Cronbach’s alpha coefficients ranging from .87 to .94 for the re-experiencing, avoidance, and hyperarousal subscale scores with the PCL total score (Ruggiero, Del Ben, Scotti, & Rabalais, 2003). The PCL-C can be used to establish a diagnosis of PTSD based on two scoring methods: by evaluating whether the total symptom severity score exceeds established cutoff scores (based on sample population) or by evaluating whether symptom endorsement is consistent with DSM-IV diagnostic criteria, the latter of which was used in the current study. More specifically, a diagnosis of PTSD was determined based on whether an individual endorsed at least one B item (questions 1-5), three C items (questions 6-12), and at least two D items (questions 13-17) from the DSM-IV diagnostic criteria with a symptom severity rating of three (“Moderate”) or above. The PCL-C demonstrated strong convergent validity with other self-report measures of PTSD symptom severity ($r > .75$; Ruggiero et al., 2003) and interview-based diagnostic measures for PTSD (Clinician Administered PTSD Scale; $r = 0.92$; Blanchard, Jones-Alexander, Buckley, & Forneris, 1996).

Posttraumatic Cognitions Inventory (PTCI; Foa, Ehlers, Clark, Tolin, & Orsillo, 1999; See Appendix D). The Posttraumatic Cognitions Inventory is a 36 item self-report measure that assesses trauma-related thoughts and beliefs. The measure

specifically gathers information regarding three trauma-related cognitive constructs: negative cognitions about the self, negative cognitions about the world, and self-blame. Respondents are asked to rate on a seven point Likert scale the extent to which they agree (“Totally disagree” to “Totally agree”) with each statement. Scale scores for each of the three domains as well as a total item score are obtained. The total score and each of the three scale scores demonstrated excellent internal consistency (total score, $a = .97$; Negative Cognitions About Self, $a = .97$; Negative Cognitions About the World, $a = .88$; Self-Blame, $a = .86$) and good test-retest reliability based on a 1-week retest interval (total score, $P = .74$; Negative Cognitions About Self, $P = .75$; Negative Cognitions About the World, $P = .89$; and Self-Blame, $P = .89$). Finally, the PTCI demonstrated convergent validity with other measures of posttraumatic cognitions and showed moderate to strong correlations with measures of PTSD severity, depression, and general anxiety.

The Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988; See Appendix E.). The MSPSS is a 12 item self-report measure that assesses the perceived availability of social support. Statements regarding the availability are rated by the respondent based on a seven point Likert scale from “very strongly disagree” to “very strongly agree”. Scoring the MSPSS yields a total score as well as subscale scores based on support source (friends, family, and significant other). The MSPSS has demonstrated good internal reliability, test-retest re-test reliability and factorial validity (Zimet et al. 1988).

The Inventory of Socially Supportive Behaviors (ISSB; Barrera, Sandler, &

Ramsey, 1981; Barrera & Ainley, 1983; See Appendix F.) The ISSB is a 40 item scale that assesses how frequently an individual was the recipient of socially supportive behaviors during the past month. Items are rated on a five point scale from “not at all” to “about every day”. This measure demonstrated strong internal consistency ($r=.93$) and test-retest reliability ($r=.88$; Barrera et al., 1981). Based on established scoring conventions, a mean frequency score was calculated for this measure.

Procedures

After participants responded to screening questions, they viewed an informed consent document which included a summary of study aims and aspects of participation, as well as contact information for psychological services, crisis hotlines, and the principal investigator. Those who provided informed consent to participate then began the survey. Participants completed the study measures including the Demographics Questionnaire, TLEQ, PCL-C, PTCI, MSPSS, and ISSB. Order of administration for the two social support measures (MSPSS and ISSB) was randomly counterbalanced within the sample (e.g. some participants completed the MSPSS first while others completed the ISSB first) to help eliminate any bias that might be introduced by order effects in the measurement of perceived availability and self-reported received social support. At the conclusion of the online survey, participants from the community sample were given the opportunity to be entered in a drawing to win a \$50 Amazon gift card. Contact information was provided via a separate link that was disconnected from the participant’s survey responses. Participants from the UMSL student subject pool provided contact information to receive course extra credit via a similar link that was disconnected from their survey responses.

Results

Sample Characteristics

Due to the particular focus on interpersonal trauma survivors in the current study, the sample was recruited using advertisements and screening questions that inquired about the experience of interpersonal trauma (“Have you ever experienced an upsetting and traumatic event? Was it caused or perpetrated by someone else?”). Cases were further screened for endorsement of interpersonal trauma based on responses to the TLEQ. Specifically, cases were included in the current sample if they endorsed at least one of 14 different types of interpersonal trauma (war, robbery, experiencing or witnessing a serious physical assault, threat for serious physical harm or death, childhood physical abuse, childhood witness of domestic violence, experiencing domestic violence, childhood sexual abuse, adult sexual assault, other forms of unwanted or uninvited sexual attention, or being stalked leading to feelings of intimidation or concerns for safety). Subjects in the current study endorsed experiencing a wide range of interpersonal and non-interpersonal traumas, resulting in a heterogeneous sample reporting diverse types and varied levels of trauma exposure (See Table 2. for description).

Data Analysis Strategy

Data analyses were completed using SPSS 20.0 and AMOS 20. Apriori and post-hoc power calculations were completed using G*Power 3.1.

Hypothesis 1. Hypothesis 1 was tested by calculating a Pearson’s correlation coefficient (r) to determine the correlation between perceived availability of social support and self-reported received social support in the current sample of interpersonal trauma survivors. Results from the analysis are described based on Cohen’s effect size

guidelines (small effect size, $r = .10$; medium, $r = .30$; large, $r = .50$ or larger). In order to run a Pearson's correlation to achieve power = .80 with alpha set at $p < .05$, a sample size of 67 was required.

Hypothesis 2. Hypothesis 2 was tested by calculating Pearson's correlation coefficient between perceived availability of social support and self-reported received social support for two specific groups within the sample; those that meet diagnostic criteria for PTSD and those that did not based on their responses on the PCL-C. Results from both of these analyses are described based on Cohen's effect size guidelines. Each of the correlation coefficients were then converted to z-scores so that a Fisher's Z Test could be calculated to test whether there was a significant difference between the perceived availability of social support (MSPSS score) and self-reported received social support (ISSB mean score) correlation coefficients between the two groups. In order to run a Pearson's correlation to achieve power = .80 with alpha set at $p < .05$, a sample size of 67 was required.

Hypothesis 3. Hypothesis 3 was tested by comparing the mean scores for perceived availability of social support (MSPSS Total Score) and self-reported received social support (ISSB Mean Score) using a two group (PTSD-positive, PTSD-negative) between-subjects multivariate analysis of variance (MANOVA). PTSD diagnostic status was used as the fixed factor grouping variable. ISSB Mean Scores and MSPSS Total Scores were used as dependent variables. Prior to main analyses, assumptions of multivariate normality, homogeneity of covariance matrices, and linearity were checked. To achieve an effect size of $f^2 = .25$ with power = .95 using two groups and two dependent variables, a total sample size of 66 was required.

Hypothesis 4. Hypothesis 4 was tested using a SEM model with three exogenous observed variables (PTCI subscales: Negative Cognitions About Self, Negative Cognitions About the World, Self-Blame), three endogenous observed variables (MSPSS Total Score, ISSB Mean Score, PCL Total Score) and three unobserved exogenous variables (error terms for the prediction of the three endogenous variables). The input model was tested to determine the goodness of fit for the overall model based on several model fit indices including the chi-squared statistic (χ^2), goodness of fit index (GFI), and the adjusted fit index (AGFI). Additionally, the Steiger-Lind root mean square error of approximation (RMSEA) and the Bentler comparative fit index (CFI) were used as the comparative fit indices for the models. Modification indices were reviewed to identify changes to the input path model. Revisions to the model that were determined to improve statistical model fit and could be justified based on current theory and empirical literature were executed. Finally, the specific path coefficients within the model were then assessed for statistical significance ($p < .05$).

Power analysis issues regarding Hypothesis 4 were given thoughtful consideration. Compared to other types of analyses, the sample size needed for testing goodness of fit for the overall model in SEM is somewhat less clear due to the variety of divergent recommendations that have been postulated. Kline (2005) suggests that to obtain adequate power researchers should collect 10 to 20 participants for every parameter in the specified model. Based on this rule for the specific model described in the current study with 20 parameters, a sample size of 200-400 participants is recommended. Other researchers have stated that to achieve appropriate power for path analysis using a common adjusted fit index (RMSEA), much larger sample sizes are

required. Tables listed in two frequently cited statistics articles indicate that with alpha set at .05, desired power set at .80, and 1 degree of freedom, sample size would need to exceed $N=1000$ (Hancock & Freeman, 2001; MacCallum, Brown, & Sugawara, 1996). However, it is challenging to find examples of applied research that achieve this stringent standard. To obtain a sense of current path analysis sample size conventions, a literature search was conducted for examples of studies with models that contain similar degrees of freedom and use the fit indices proposed in the current study. Sample size conventions demonstrated in multivariate statistics textbooks (e.g. Myers, Gamst, Guarino & 2006; Todman & Dugard, 2007) and recent trauma-specific studies that used path analysis (see Table 3.) had sample sizes ranging from 99 cases to 594. Based on this thorough consideration of power for SEM, a sample size of 600 was proposed to meet the demands of the current study. Due to significant participant attrition and missing data, the available sample size for the SEM model reached 397 cases. However, this sample size still easily exceeds the conventions set forth by Kline (2005) and is consistent with similar studies described in Table 3.

Missing Data

Several factors were considered to determine the most advantageous approach for handling the missing data including: the origin of the missing data, the type of proposed analyses, and power analysis issues. Based on non-significant results for Little's MCAR test, $\chi^2(173) = 83.14, p = 1.000$, the data can be classified as missing completely at random (MCAR). Data that is identified as MCAR is capable of yielding unbiased parameter estimates. The primary consequence for missing data of this type is the loss of statistical power (Graham, 2009). Apriori power analyses suggest that correlation and

MANOVA procedures to test Hypotheses 1-3 would be well-powered with even the most conservative sample size. Additionally, the benefit of using imputation procedures for testing Hypotheses 1 and 2 which are based on correlating two scores appears limited. Therefore, it was determined that listwise deletion should be utilized for analyses to test Hypothesis 1-3 which yields a sample size of 476 cases.

Hypothesis 4 will be tested using SEM, which typically requires greater sample sizes and presents additional options for handling missing data. Full information maximum likelihood (FIML) estimation method is the recommended analysis when data are determined to be MCAR or MAR (Buhi, Goodson, & Neilands, 2008) and has been shown to outperform other classic missing data methods based on computer simulation studies (Arbuckle, 1996; Enders & Bandalos, 2001; Peters & Enders, 2002). FIML utilizes all present data by partitioning cases into subsets with the same pattern of missing information, allowing for calculation of parameter estimates and standard errors without case deletion or missing value imputation (Kline, 2011). Although model testing using FIML estimation method is capable of calculating model fit estimates with samples that include missing data which increases power, such methods prevent the usage of important aspects of SEM including certain conventional goodness of fit indices (e.g. GFI, AGFI) and modification indices in AMOS. Therefore, listwise deletion was used to identify a complete sample for all measures used in the SEM model, resulting in a sample size of 397 for the current analysis. As stated, although this method will result in a loss of power, potential bias on parameter estimates is less of a concern as data were determined to be missing completely at random (Little's MCAR test, $\chi^2(173) = 83.14, p = 1.000$; Graham, 2009).

Descriptive Statistics and Data Screening

Prior to main analyses for Hypotheses 1-3, descriptive statistics for continuous study variables were examined (see Table 4.; data screening for Hypothesis 4 was completed separately). Variable data for Hypotheses 1-3 were screened for univariate outliers. Box plots did not reveal any univariate outliers for MSPSS Total Scores, but did identify four univariate outliers for ISSB Mean Scores which were deleted from subsequent analyses for Hypotheses 1-3. Skew and kurtosis values for all variables were in the range of -1 to 1 indicating relatively normal variable distributions. The data were also screened for multivariate outliers based on Mahalanobis distance values derived from a regression model using PTSD diagnostic status as the independent variable. No multivariate outliers were identified in the sample. Additionally, pretests were run to assess whether any significant demographic differences emerged between cases categorized as meeting diagnostic criteria for PTSD compared to those who did not meet criteria for PTSD. These tests identified statistically significant differences between the PTSD-positive and PTSD-negative groups based on age ($t=2.58, p=.01, r=.11$), household income level ($\chi^2=5.74, p=.02, \phi=.11$), and recruitment source ($\chi^2=45.53, p=.00, \phi=.29$). Due to the large sample size in the present study, effect sizes were also considered to further clarify the practical significance of these group differences. Statistical differences based on age ($r=.11$) and household income ($\phi=.11$) produced small effects while differences based on recruiting source produced a medium effect ($\phi=.29$). Considering statistical significance and effect size calculations indicating the magnitude of the effect for these demographic variables, recruitment source is the only demographic variable shown to be significantly different between PTSD positive and

PTSD negative groups with at least a moderate effect. Therefore, analyses for Hypotheses II and III which use PTSD diagnosis as a grouping variable will be run a second time controlling for the effects of recruitment source.

Main Analyses Results

Hypothesis 1. Hypothesis 1 predicted that there would be a positive, moderately strong correlation between perceived availability of social support and self-reported received social support in an interpersonal trauma-exposed sample. To test this hypothesis, a bivariate correlation was run between ISSB mean scores and MSPSS total scores. Based on a sample size of 472 with alpha set at $p < .05$, observed power = .99 to detect a medium effect ($r = .30$). Analyses demonstrated that socially supportive behavior was significantly related to perceived availability of social support with a large effect, $r = .50$, p (*one-tailed*) $< .001$. Results indicate $R^2 = .25$, meaning that socially supportive behavior accounts for 25% of the variance in perceived availability of social support. Results of this analysis confirm Hypothesis 1 as perceived availability of social support and self-reported received social support demonstrated a large, positive correlation.

Hypothesis 2. Hypothesis 2 predicted that the positive correlation between perceived availability of social support and self-reported received social support would be stronger for those meeting diagnostic criteria for PTSD. To test this hypothesis, bivariate correlations were run between ISSB mean scores and MSPSS total scores for the sample meeting diagnostic criteria for PTSD ($n = 204$) compared to the sample endorsing subthreshold PTSD symptoms ($n = 268$). Post-hoc power analyses with alpha set at $p < .05$ to detect a medium effect ($r = .30$) indicate observed power = .99 for both sub-

samples. In the PTSD-positive sample, socially supportive behavior was significantly related to perceived availability of social support with a large effect, $r = .63$, p (*one-tailed*) $< .001$. Socially supportive behavior accounted for 40% ($R^2 = .40$) of the variance in perceived availability of social support. In the PTSD-negative sample, socially supportive behavior was also significantly related to perceived availability of social support with a medium effect, $r = .40$, p (*one-tailed*) $< .001$. Socially supportive behavior accounted for 16% ($R^2 = .16$) of the variance in perceived availability of social support. Based on Fisher's Z-test, the difference between the social support measure correlation coefficients in the two sub-samples (PTSD-positive versus PTSD-negative) was identified as statistically significant ($Z = 3.40$, p (*one-tailed*) $< .001$), indicating the relationship between received social support and perceived availability of social support is significantly stronger in the PTSD-positive sample. Correlations between socially supportive behavior and perceived availability of social support were re-run controlling for the effects of recruitment source and remained highly significant (PTSD-positive: $r = .63$, p (*one-tailed*) $< .001$; PTSD-negative: $r = .38$, p (*one-tailed*) $< .001$). Results of this analysis confirm Hypothesis 2 as the correlation between received social support and perceived availability of social support was significantly stronger for the PTSD-positive sample.

Hypothesis 3. Hypothesis 3 predicted that significant between group differences will exist between the PTSD-positive and PTSD-negative groups such that measures of self-reported received social support and perceived availability of social support will be significantly lower for those meeting diagnostic criteria for PTSD. Prior to main analyses, multivariate assumptions were checked. Tests of normality were assessed for the

independent variables (ISSB mean scores, MSPSS total scores) and produced significant results for the Kolmogorov-Smirnov test and Shapiro-Wilk test, suggesting the possibility of normality violations. However, such violations are common with larger sample sizes (Field, 2009). Further examination of the Q-Q plots demonstrated strong linear relationships between observed and expected values. Therefore, the assumption of multivariate normality was determined to have been met.

The assumption for homogeneity of covariance matrices was assessed using Box's Test for Equality of Covariance Matrices. This test produced a significant result (Box's $M= 20.62$, $p<.001$) indicating the possibility that dependent variable covariance matrices may be significantly different between the PTSD-positive and PTSD-negative groups. Due to the known sensitivity of Box's Test, further analyses were conducted to assess this assumption. Based on established recommendations (Tabachnick & Fidell, 2007), between group variances and covariances were further assessed. Because the variance in dependent variables is greater in the smaller of the two samples (PTSD-positive group), the results of Box's Test cannot be dismissed and significance of the test results must be interpreted with caution due to increased chance for Type I error. Consistent with the results of Box's Test, Levene's Test of Equality Error Variances, which tests for homogeneity of variance violations for each dependent variable, was also significant ($p<.05$) for both dependent variables. Therefore, tests of between-subjects effects must also be interpreted with caution. Due to these violations of assumptions, the use of a more stringent significance level ($p<.01$) will be used to interpret these test results, consistent with recommendations in Tabachnick and Fidel (2007). Bartlett's Test of Sphericity is statistically significant (approximate chi-square=268.43, $p<.001$)

indicating sufficient correlation between the dependent measures to proceed with the analysis.

A two group (PTSD-positive, PTSD-negative) between-subjects multivariate analysis of variance (MANOVA) was conducted with ISSB mean scores and MSPSS total scores as dependent variables. With a sample size of $n=472$ for a MANOVA with two groups and two dependent variables, achieved power = 1.000. The overall multivariate test was significant, $F(2, 469) = 39.094, p < .001, partial \eta^2 = .143$, indicating that there was a significant effect of PTSD diagnostic status on levels of self-reported received social support and perceived availability of social support. Tests of between subjects effects revealed significant group differences for MSPSS total score, $F(1, 470) = 51.045, p < .001, partial \eta^2 = .098$, with subjects meeting criteria for PTSD endorsing significantly less perceived availability of support ($M=4.42, SD=1.68$) compared to those who did not meet criteria for PTSD ($M=5.41, SD=1.32$). Based on the *partial η^2* value, we can conclude that PTSD diagnostic status accounts for 10% of the variance in perceived availability of social support. However, differences between groups on ISSB mean scores were not significantly different, $F(1, 470) = .447, p = .50, partial \eta^2 = .001$ (See Table 5. for display of results). Furthermore, those with PTSD actually reported *higher* mean ISSB scores, indicating they actually received *more* social support compared to those without PTSD. Therefore, Hypothesis 3 was partially confirmed as subjects with PTSD reported significantly lower levels of perceived availability of social support.

Prior analyses indicated that recruitment source (student vs. community) was significantly different between the PTSD-positive and PTSD-negative subject groups. Therefore, a factorial MANOVA which included PTSD diagnostic status and recruitment

source as independent variables for ISSB mean scores and MSPSS total scores was run. The objective of this analysis was to test whether PTSD diagnostic status retains significant effects when the influence of recruitment source on social support outcome variables is also considered. (The same violation of assumption related to heterogeneity of covariance based on significant Box's M Test also applies to this analysis. As such, the more stringent significance level of $p < .01$ will continue to be used). Results of this analysis were consistent with original findings such that PTSD diagnostic status produced a significant main effect on social support outcome variables, $F(2,467) = 31.63, p < .001, partial \eta^2 = .119$. Results of between subjects effects for PTSD diagnostic status remained consistent with original findings when recruitment source was added to the model. Tests of between subjects effects revealed significant group differences for MSPSS total score, $F(1,471) = 32.38, p < .001, partial \eta^2 = .065$, with subjects meeting criteria for PTSD endorsing significantly less perceived availability of support compared to those who did not meet criteria for PTSD. Differences between PTSD diagnostic groups on ISSB mean scores remained non-significant, but do account for more variance compared to the previous model, $F(1,471) = 3.50, p > .05, partial \eta^2 = .007$.

Hypothesis 4. Hypothesis 4 predicted that higher levels of negative posttraumatic cognitions regarding self, world, and self-blame will predict lower levels of perceived availability of social support and self-reported received social support. Higher levels of negative posttraumatic cognitions regarding self, world, and self-blame were also hypothesized to directly predict greater PTSD symptoms. Finally, lower levels of perceived availability of social support and self-reported received social support were hypothesized to predict greater PTSD symptoms (see Figure 1. for input path diagram).

Prior to main analyses, aspects of the data that would affect SEM analyses were examined (see Table 7. for descriptive statistics of variables in SEM model). Univariate normality of the variables was established as all variables included in the model have skew and kurtosis values which fall within the normal range (-1.00-1.00). Variables were screened for univariate outliers based on z-score conversions. All variables had less than 1% of cases with z-score values above 2.58, consistent with expectations based on the normal distribution. Therefore, no univariate outlier cases were removed. Mahalanobis distance values were calculated to check for multivariate outliers based on critical χ^2 (6) =22.46. No cases were identified as exceeding this cutoff value, meaning the sample was free from multivariate outliers. Multivariate normality was assessed through the use of a bivariate scatter plot matrix including all six variables in the SEM model. Results of these plots were difficult to interpret based on the large sample size of the current study, but do not appear to indicate any curvilinear variable relationships. Additionally, linearity and homoscedasticity were also assessed by examining the residuals of a regression equation with PCL total score as the dependent variable and all other observed model variables as independent variables. Examining the p-p plot and the histogram for the standardized regression residuals and the scatterplot for regression residuals graphed against predicted values suggest normal distribution of the residuals and provide evidence for multivariate normality. Based on this analysis, the assumption of multivariate normality is retained. Collinearity assumptions were also maintained as bivariate correlations between all variables in the model are below $r=.90$. Table 6. displays the bivariate correlations of all variables included in the SEM model.

To examine study hypotheses, structural equation models were analyzed with maximum likelihood estimation method using AMOS 20. The chi-squared statistic (χ^2), goodness of fit index (GFI), and the adjusted fit index (AGFI) were used to assess the proportion of observed variance explained by the model. Additionally, the Steiger-Lind root mean square error of approximation (RMSEA) and the Bentler comparative fit index (CFI) were used as the comparative fit indices for the models. The chi-squared statistic (χ^2) tests the amount of difference between the expected and observed covariance matrices with smaller values indicating better fit. Acceptable model fit is indicated when $\chi^2 p > .05$. Values for CFI, GFI, and AGFI above .95 and RMSEA values of .06 or less are indicative of a good model fit (Hu & Bentler, 1999).

Although model testing using Full Information Maximum Likelihood estimation methods are capable of calculating model fit estimates with samples that include missing data, such methods prevent the usage of important aspects of SEM including GFI, AGFI, and modification indices in AMOS. Therefore, listwise deletion was used to identify a complete sample for all measures used in the SEM model, resulting in a sample size of 397 for the current analysis. Although this method will result in a loss of power, potential bias on parameter estimates is less of a concern as data were determined to be missing completely at random (Little's MCAR test, $\chi^2(173) = 83.14, p = 1.000$; Graham, 2009).

Based on these conventions, the initial hypothesized path model was tested. The input path model was a poor fit with the study data, $\chi^2(1) = 140.04, p < .001$ (RMSEA=.59, 90% CI=.51-.67, CFI=.88, GFI=.91, AGFI= -.90; See Figure 3.). Modification indices were reviewed to identify adjustments that may improve model fit, which provide information regarding the estimated decrease in the chi-squared statistic

and estimated change in the parameter estimate that would result based on each modification (Arbuckle, 2011). Modification indices showed that model fit would be improved (MI=114.91, Par Change= .78) by adding a parameter estimate to assess the prediction of MSPSS total scores by ISSB mean scores. Adding this parameter estimate into the model is theoretically consistent with the proposed relationship between these social support variables and would statistically improve the accuracy of the model parameter estimates. Therefore, a parameter estimate predicting MSPSS total scores by ISSB mean scores was added to the SEM model.

With the inclusion of the additional parameter estimate, the modified path model is fully saturated with 0 degrees of freedom. As such, model fit statistics that describe the overall fit of the model to the observed data cannot be calculated. However, the statistical significance of the standardized estimates may proceed. Review of the standardized estimates indicates that Hypothesis 4 was partially supported by the model. Negative posttraumatic cognitions regarding self and the world significantly predicted lower levels of perceived availability of social support. Negative posttraumatic cognitions regarding self blame also significantly predicted perceived availability of social support, but the direction of this relationship was unexpectedly positive such that higher levels of self blame significantly predicted higher levels of perceived availability of social support. Received social support also significantly predicted perceived availability of social support. In total, the model accounted for 46% of the variance ($R^2=.46$) in perceived availability of social support.

Hypotheses regarding the model's ability to predict self-reported received social support were also examined. Higher levels of negative posttraumatic cognitions regarding

self significantly predicted lower levels of self-reported received support. However, negative posttraumatic cognitions regarding the world showed a significant, unexpected positive relationship with received support. The relationship between posttraumatic cognitions regarding self blame and received social support was non-significant. The model was only able to account for 3% ($R^2=.03$) of the variance in self-reported received social support, which is considerably less than the model's ability to predict levels of perceived social support and PTSD symptoms.

Finally, hypotheses regarding the model's ability to account for the variance in PTSD symptom severity were also tested. Self-reported received social support significantly predicted PTSD symptom severity, but these variables demonstrated a positive relationship which was contrary to expectation. Perceived social support demonstrated a significant negative association with PTSD symptoms. Higher levels of negative posttraumatic cognitions regarding self and the world significantly predicted higher PTSD symptoms. However, negative posttraumatic cognitions regarding self blame unexpectedly showed a significant negative association with PTSD symptoms such that higher levels of self blame were associated with lower levels of PTSD. The model accounted for 58% of the variance in PTSD symptom levels ($R^2=.58$).

Discussion

Study results supported Hypothesis 1 and demonstrated that levels of self-reported received support were very strongly associated with perceived sense of support in the current sample of interpersonal trauma survivors. Specifically, the assessment of targeted, behaviorally-specific supportive behaviors within a specific time frame showed a relationship to people's more subjective, global perceptions of the extent to which they

feel adequately supported by current relationships with friends, family, and significant others. The strength of the relationship between these variables is considerable compared to a prior meta-analysis of 23 studies which concluded that only a moderately strong relationship between perceived and received support existed ($r = .35$; Haber et al. 2007). Additionally, another study on the topic that specifically compared the correlation between levels of perceived and received social support failed to find a significant relationship between these constructs (Lakey & Heller, 1980). Therefore, the present study suggests that a stronger relationship between perceived support and received support exists than has previously been documented in the social support literature.

Differences in results between past research and the current study investigating the correlation between perceived social support and received support require consideration. The studies by Haber et al. (2007) and Lakey et al. (1980) included community-based and university samples. Although the current study recruited subjects from similar locations, inclusion criteria specifically targeted survivors of interpersonal trauma. The correlation between perceived social support and received social support may be stronger in the current study because people with histories of interpersonal trauma are substantially more aware of their interactions with others. For example, people who have experienced interpersonal trauma have been injured or violated by someone in the past, which promotes a current sense of vigilance in relationships. This sense of interpersonal vigilance could influence the assessment of perceived and received support levels. Interpersonal trauma survivors may become more accurate, or at least more consistent, reporters of the specific behaviors others engage in to help them and the associated sense of support they experience.

Prior research on the relationship between perceived support and received support included studies that were published before 2002. Important technological advancements and cultural shifts have occurred since that time which changed the nature of social relationships. For example, the popularization of social media applications (e.g. Facebook), cell phone use, and texting influence the way that we experience and perceive social relationships. Based on these factors, the qualitative and quantitative nature of perceived support and received support has changed in significant ways since the publication of this prior research. These changes may have influenced the increased correlation between levels of perceived social support and received social support.

Although the current results demonstrate a strong correlation between perceived social support and received social support, the scope of the conclusions that can be drawn should be kept in perspective. It seems parsimonious to assume that actual supportive behaviors (e.g. received support) is the factor that determines or causes an individual's overall perceived sense of support. However, without the benefit of a longitudinal research design that can establish temporal precedence, the direction of the relationship between these variables cannot be assumed. Therefore, current study results suggest a strong correlation between these constructs but cannot determine their causal relationship. Additionally, although a significant amount of shared variance exists between these variables, the majority (75%) of the variance for perceived social support and self-reported received social support is unexplained by the current correlation analysis. There remains a large degree of fluctuation in levels of received social support and perceived social support which must be influenced by factors that are not accounted for in the current bivariate correlation. Future research must continue to identify the

causal relationship between these variables and isolate additional factors that influence their variance.

The results of the current study also support Hypothesis 2 indicating that individuals who meet diagnostic criteria for PTSD demonstrate a stronger positive correlation between perceived social support and self-reported received social support. Based on these results, we can conclude that individuals with PTSD report levels of perceived social support and self-reported received social support that are more strongly related (e.g. the variance in each variable is well accounted for by the other) compared to the PTSD-negative group. But, the reason for this greater correlation of support types based on PTSD diagnostic status remains unclear. It was hypothesized that those meeting criteria for PTSD would report lower levels of perceived support and lower levels of self-reported received support, thus decreasing the variance in both these variables and strengthening their subsequent correlation. However, additional study analyses indicated that those with PTSD actually endorsed *higher* levels of received social support compared to the PTSD-negative group. Therefore, although the strength of the relationship between perceived social support and received social support was greater for the PTSD-positive group, the reasons for this greater association remain ambiguous and require further investigation.

Hypothesis 3 was partially supported by the results of the current study. Consistent with the prior literature on PTSD and the protective effects of social support (e.g. Brewin et al., 2000; Ozer et al., 2003), individuals meeting diagnostic criteria for PTSD reported lower levels of perceived social support, meaning they feel less supported by current relationships with friends, family, and significant others. Contrary to

expectation, the PTSD-positive group actually reported *higher* levels of received social support compared to the PTSD-negative group. These results highlight the important distinction between perceived social support and functional or received social support and the differences in their relationship to PTSD diagnostic status. The contrast between levels of perceived and received support reiterates the multifaceted nature of social support and the importance of examining the nuances of this variable. Based on the analysis results, assuming that *more* social support means *less* psychopathology, particularly related to PTSD, is a clear oversimplification of these variables.

Several aspects of the posttraumatic support process may be considered to further understand why the PTSD-positive group reported higher levels of received support and how that relates to their functioning. Prior research evaluating the utility of these support types has found perceived support to have greater buffering effects against various forms of distress (e.g. depression, anxiety) compared to several types of received support in a longitudinal study of violent crime victims (Kaniasty et al. 1992). Combined with these prior findings, it may be concluded that level of received support may be less central to posttraumatic adaptation compared with the level of perceived support which takes precedence. Interpretation of current study findings must also consider the influence of study design. In the cross-sectional design of the current study, social support levels are being measured concurrently to PTSD symptoms. As such, it is possible that level of received social support may actually be serving as an indication for the level of support needed by individuals who present with a high level of PTSD symptoms at the present time. Individuals in the PTSD-positive group may be reporting higher levels of received support because they require a greater level of assistance from their social support

network to function. If these circumstances are correct, the level of received support may best be conceptualized as a consequence of elevated PTSD symptoms rather than a protective factor against the development of posttraumatic distress. However, a longitudinal design study is needed to tease apart the temporal relationship of these variables.

The factors that affect the development and maintenance of PTSD and determine which trauma-exposed individuals become symptomatic is an area that requires further research. The SEM model tested in the current study was aimed at discovering additional information regarding the ways in which posttraumatic cognitions, received social support, and perceived social support influence the severity of PTSD symptoms. Evaluation of several fit indices indicated that the input path model did not adequately fit the study data, meaning that the overall proposed relationship between variables may not be the most effective way of accounting for associations between variables in the model. Such an outcome is not uncommon in SEM and may be considered a step along the way in the process of obtaining best model fit. One of the benefits with SEM is having the ability to use model fit indices and theory to modify the initial model and improve model fit. These steps were carried out in the current study, but resulted in a fully saturated model, which prevents assessment of model fit statistics. Future studies that utilize SEM to measure the relationships between posttraumatic cognitions, received social support, perceived social support, and PTSD symptom severity may benefit from several changes in the data analytic plan (see Limitations and Future Directions section for further discussion).

Review of the statistical significance of the standardized estimates within the model revealed that Hypothesis 4 was partially supported. Many of the relationships observed in the model occurred as expected. Negative posttraumatic cognitions regarding self and the world significantly predicted lower levels of perceived availability of social support. Negative posttraumatic cognitions regarding self significantly predicted lower levels of received support. These results suggest that individuals who view themselves and the world more negatively following traumatic events perceive that less support is available and may actually receive less support. This finding is important because it suggests that the way social processes are perceived and experienced following traumatic events is significantly influenced by individuals' posttraumatic cognitive framework. Additionally, negative posttraumatic cognitions regarding self and world were negatively associated with PTSD symptom severity. These results carry important implications for the way we treat PTSD symptoms. Cognitive behavioral interventions that address overaccommodated negative posttraumatic thoughts regarding self and the world may effectively reduce PTSD symptom severity directly, but could also serve the additional benefit of modifying and increasing perceptions of support and the ability to receive support.

Some results from the model were unexpected and require further consideration. Posttraumatic self blame was positively associated with perceived social support. A possible explanation for this relationship is that negative cognitions regarding self blame are directed inward, meaning that perceptions of others can remain positive and intact. Although the relationship between posttraumatic self blame and received support was not statistically significant, the nature of this relationship was also positive which may

provide additional support for this explanation. The significant positive relationship between self-reported received social support and PTSD symptom severity was also an unexpected finding. However, consistent with the discussion of results testing Hypothesis 3, higher levels of received support may actually reflect severity of psychopathology such that individuals require more assistance from others to function. Placed in this context, the positive association between received support and PTSD symptom severity is more plausible. Finally, higher levels of posttraumatic self blame were significantly associated with lower PTSD symptoms. If an individual blames themselves regarding the traumatic event, larger cognitive schemas regarding the world and other people can remain intact which is reflected in lower posttraumatic distress symptoms. Considering the origin of these unexpected findings yields a greater understanding of these variables.

The present model's ability to predict a substantial amount of the variance in perceived social support and PTSD symptom severity indicates that it is possible to achieve a fair understanding for some of the factors that influence these variables. Specifically, this understanding is achieved through the measurement of other variables included in the model such as posttraumatic cognitions and received social support. However, observation of these same variables provides little assistance toward understanding the variance in received social support. The reasons for this may lie in the broad range of factors that can affect the receipt of social support, the reporting of social support, and the overall measurement of this construct.

At a glance, received social support would appear to be something that lends itself well to accurate measurement. Questionnaires focused on this construct can ask behaviorally-specific questions about the presence or absence of certain actions by people

in an individual's social support network. However, because measures of received support are contingent on recalling specific events, variability in memory between people and within the same person across time would result in less consistent measurement. Additionally, there are factors that would legitimately affect the variability of measurement for received social support on a given day which are unrelated to accurate recall or other things measured in the model such as posttraumatic cognitions or PTSD severity. For example, question 17 on the ISSB inquires about whether the respondent received \$25 or more from someone over the past four weeks. Whether this form of support occurred would be contingent on many factors such as whether the individual was employed, whether the individual made it known to others that they needed money, and whether the individual had more or less financial demands placed on them that month. As another example, question 38 inquires about whether someone provided the respondent with a place to stay over the past four weeks. Individuals that can afford their own residence would be prevented from ever responding yes to this question because this type of support is not relevant to them. Additionally, both of these examples would potentially be influenced more broadly by factors such as SES and cultural practices. Although the ISSB is a well-established measure of received social support, these issues represent the challenges of accurately measuring an idiographic psychological construct.

One of the primary goals of the present study was to engage in a comparative evaluation of social support and posttraumatic cognitions as etiological factors in the development and maintenance of PTSD, which was partially achieved with results of the SEM model. Prior research on PTSD and social support has reliably described the benefits of social support (particularly perceived social support) and its capacity to buffer

against PTSD symptoms. Although the results for received social support were less expected, the positive effects of perceived social support are confirmed by current study analyses testing Hypotheses 3 and 4. Specifically, those meeting criteria for PTSD reported lower levels of perceived social support and perceived social support was negatively associated with PTSD symptom severity. However, it is important to observe that the size of the beta weight and the significance level for posttraumatic cognitions regard self and world were much greater than perceived social support in predicting PTSD symptom level. Therefore, prior research describing the robust relationship between perceived social support and PTSD symptoms should be reviewed to determine whether posttraumatic cognitions were also tested for their influence. Additionally, these results confirm the important role of perceived social support and posttraumatic cognitions in etiology models for PTSD.

Limitations and Future Directions

There are several important limitations to note in the present study. The sample was predominantly female (78%), Caucasian (70%), non-Hispanic (92%), and reported being single (55%). Prior research has demonstrated the influence of various demographic factors such as gender, race, ethnicity, age, and culture on social support processes and the development of PTSD. Therefore, it remains uncertain whether having a more diverse sample would have yielded different results. Study replication with a more diverse sample would help strengthen the validity of the results.

Participant attrition was an important factor that significantly reduced study sample size. Although Little's Test determined that data was missing at random, it is challenging to definitively conclude whether respondents who completed the study were

different in some way from those who did not. Collecting data via other avenues that are less prone to attrition (e.g. in-person study participation) may provide some benefit toward encouraging completion. Under these circumstances, if a given participant did choose to discontinue participation while completing the study in-person, the researcher could engage the participant in a dialogue to further clarify the reasons for their decision (e.g. discomfort versus boredom).

Structural equation modeling yields the most accurate results with larger samples. The statistical power for the analysis used to test Hypothesis 4 was likely underpowered in the present study. The ability to accurately test the fit of the proposed path model with observed data would be improved with a larger sample size. An additional option would be to conduct preliminary research to further clarify relationships between posttraumatic cognitions and social support types. Results of this research could be used to inform revisions to the initial input path model which would remove the measurement of unnecessary parameter estimates and provide greater focus to the model. Such revisions would yield a more parsimonious initial model to facilitate interpretation of the parameter estimates. This approach would also confer the functional benefit of increasing degrees of freedom in the model, thus increasing statistical power. Additionally, alternative input models that incorporate the use of latent variables comprised of multiple social support indicators may provide some benefit.

Results from the current study identify important areas of inquiry for future studies. There is a particular need for additional longitudinal research design studies with interpersonal trauma survivors that can analyze the temporal relationship between perceived social support and received social support. Such research would provide more

opportunities for investigating whether one of the variables is causative or whether these variables simply covary. More research with a variety of different social support measures would also facilitate accurate assessment of these constructs. Using a multi-trait, multi-method assessment approach would help capture the variation and nuances in social processes that exist due to the influence of gender, culture, age, ethnicity, psychopathology, and reporting style. Additional research to provide further clarity regarding unexpected findings from the present study would also be beneficial. Specifically, future studies that aim to understand what factors contribute to the greater observed correlation of perceived and received social support in those meeting criteria for PTSD, factors that contribute to the variance in the measurement of received support, and factors that explain the complex relationship of posttraumatic self blame with social support and PTSD symptoms should be initiated.

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Table 1.

Participant Demographics Based on PTSD Diagnosis (N=574)

	Total Sample	PTSD +	PTSD -	Statistic	<i>p</i>	Effect Size
Age	<i>M</i> = 30.29 <i>SD</i> = 12.24	<i>M</i> =31.83 <i>SD</i> =12.37	<i>M</i> =29.08 <i>SD</i> =12.03	<i>t</i> =2.58	.01*	<i>r</i> =.11
Gender						
Male	125 (22%)	45 (19%)	71 (24%)	$\chi^2=2.10$	.15	$\phi=.06$
Female	446 (78%)	191 (80%)	221 (75%)			
Race						
White	394 (70%)	163 (69%)	200 (70%)	$\chi^2=0.19$	.91	$\phi=.02$
Minority	171 (30%)	75(31%)	87 (30%)			
Ethnicity						
Hispanic	42 (8%)	17 (7%)	21 (7%)	$\chi^2=0.00$	.98	$\phi=.00$
Non-Hispanic	513 (92%)	214 (93%)	263 (93%)			
Marital Status						
Married/cohabitating	193 (34%)	72 (31%)	101 (35%)	$\chi^2=1.03$	.60	$\phi=.04$
Unmarried	378 (66%)	164 (69%)	191 (65%)			
Education						
College degree or above	245 (43%)	105 (45%)	115 (39%)	$\chi^2=4.23$	.12	$\phi=.12$
Less than college degree	325 (57%)	129 (55%)	178 (61%)			
Household Income						
< \$ 30,000	317 (57%)	146 (63%)	153 (53%)	$\chi^2=5.74$	.02*	$\phi=.11$
> \$ 30,000	244 (43%)	85 (37%)	137 (47%)			
Recruitment Source						
Community	294 (51%)	155 (65%)	105 (36%)	$\chi^2=45.53$	.00*	$\phi=.29$
Student	281 (49%)	83 (35%)	189 (64%)			

Note: *= $p < .05$

Table 2.

Trauma Exposure (N=574)

Trauma Type	Percent of Sample
Interpersonal Trauma	
War	7%
Robbery	20%
Witness Physical Assault or Murder	22%
Threat for Harm or Death	55%
Childhood Physical Abuse	34%
Childhood Witness of Domestic Violence	43%
Childhood Sexual Abuse (Older Perpetrator)	34%
Childhood Sexual Abuse (Similar Age Perpetrator)	26%
Teenage Sexual Abuse (age 12-18)	28%
Adult Domestic Violence	46%
Adult Physical Assault	22%
Adult Sexual Assault	27%
Unwanted/Uninvited Sexual Attention	55%
Stalking	37%
Non-Interpersonal Trauma (experienced in addition to interpersonal trauma)	
Natural Disaster	42%
Motor Vehicle Accident	31%
Accident	22%
Sudden/Unexpected Death of Loved One	71%
Life Threatening Illness	23%
Loved One Survived Life-Threatening Event	63%
Miscarriage	20%
Abortion	21%

Table 3.

Description of Recent Trauma-Related Studies Using Path Analysis

Study	Year	Sample Size	χ^2 df	Model Fit Tests
Hodgdeson & Webster	2011	N= 333	10	χ^2 , CFI, RMSEA, AIC
Rhatigan, Shorey & Nathanson ¹	2011	N=213	0	None
Wu	2011	N=175	4	χ^2 , GFI, AGIF, RMSEA, SRMS, AIC, BIC
Nickerson, Bryant, Brooks, Steel, & Silove	2009	N=315	3, 4	χ^2 , SRMR, RMSEA, CFI, TLI
Fortier et al.	2009	N=99	0, 3	χ^2 , RMSEA, SRMR, CFI
Myers et al.	2008	n=122 n=199 n=47	2	Santorra-Bentler scaled χ^2 , CFI
Vaddiparti et al.	2006	N=594	0, 1	χ^2 , RMSEA, NNFI
Sumer, Karanci, Berument & Gunes	2005	N=336	15	χ^2 , GFI, AGFI, RMSEA, CFI

Note: AGIF= Adjusted Goodness of Fit Index, BIC=Bayes Information Criterion, CFI= Comparative Fit Index, NNFI= Non-Normed Fit Index, RMSEA= Root Mean Square Error Approximation, SRMR= Standardized Root Mean Square Residual, TLI= Tucker-Lewis Index. Due to lack of degrees of freedom, this study did not test for model fit and focused on mediated path analyses between variables.

Table 4.

Descriptive Statistics for Continuous Social Support Variables (n=475)

Variable	<i>M (SD)</i>
MSPSS Total Mean Score	4.99 (1.56)
ISSB Mean Score	2.41 (0.92)

Table 5.

Mean Scores and Standard Deviations for Measures of Received Social Support and Perceived Availability of Social Support (n=472)

<i>Group</i>	<i>ISSB Mean Score</i>		<i>MSPSS Total Score</i>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
PTSD-positive (n=204)	2.43	.99	4.42	1.68
PTSD-negative (n=268)	2.37	.82	5.41	1.32

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Table 6.

Multivariate and Univariate Analysis of Variance for Social Support Measures (n=472)

<i>Test</i>	<i>df</i>	<i>F</i>	<i>P-Value</i>	<i>Partial η^2</i>
Multivariate Test	2, 469	39.09	.000	.143
Univariate Tests				
ISSB Mean	1,471	0.45	.504	.001
MSPSS Total	1,471	51.05	.000	.098

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Table 7.

Bivariate Correlations of Model Variables (n=397)

	1	2	3	4	5	6
1. PCL_Total	—	.09*	-.35**	.73**	.61**	.47**
2. ISSB_Mean		—	.50**	-.05	.07	.01
3. MSPSS_Total			—	-.47**	-.34**	-.26**
4. PTCI_NegSelf				—	.70**	.73**
5. PTCI_NegWorld					—	.50**
6. PTCI_Blame						—

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

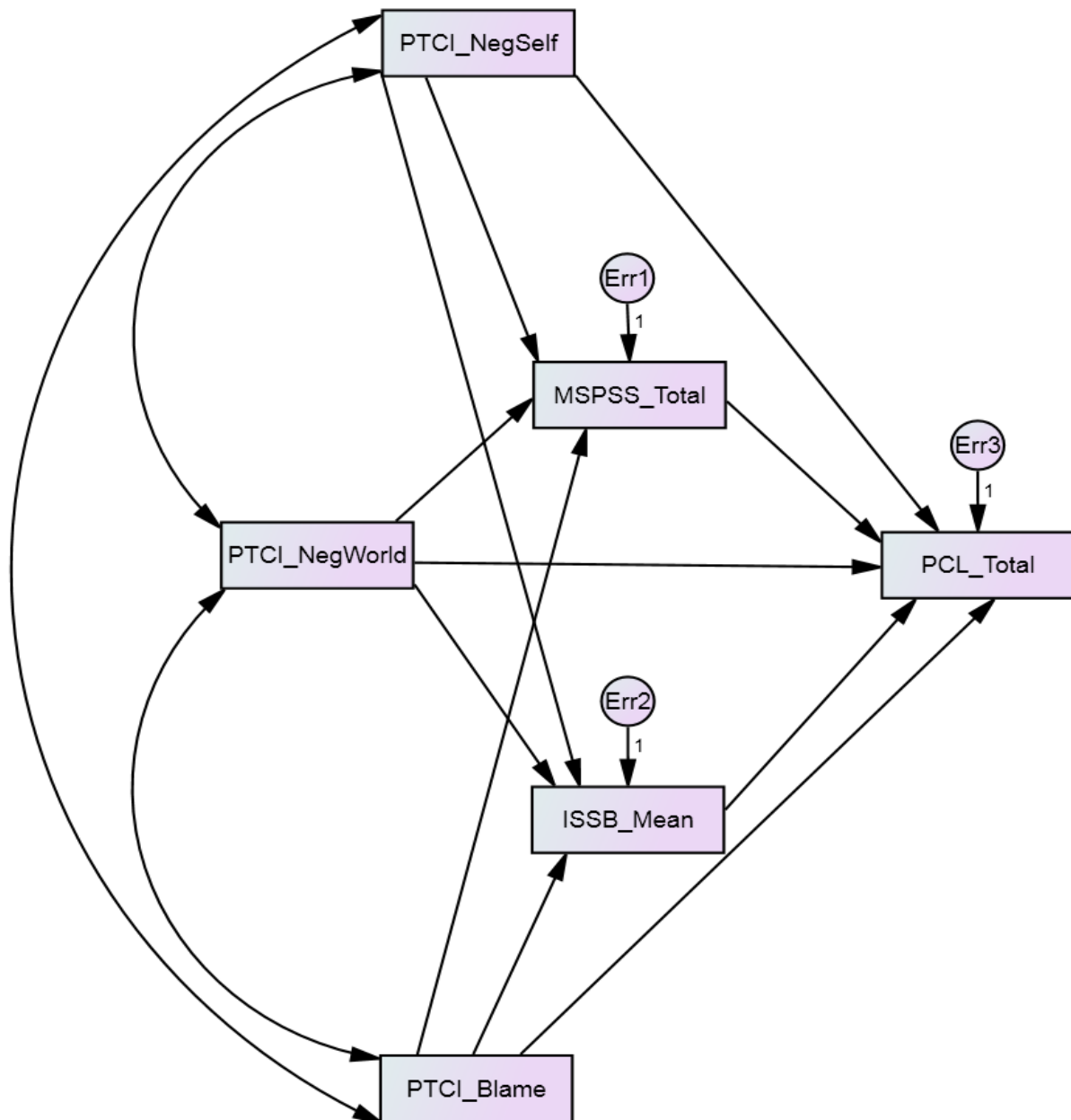
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Table 8.
Descriptive Statistics for Continuous Variables in SEM Model (n=397)

Variable	<i>M (SD)</i>
PCL Total Score	43.99 (17.91)
PTCI-Negative Cognitions of Self	2.78 (1.63)
PTCI-Negative Cognitions of World	4.37 (1.66)
PTCI-Self Blame	2.90 (1.76)
MSPSS Total Score	5.01 (1.58)
ISSB Mean Score	2.43 (0.93)

Figure 1.

Input path diagram.



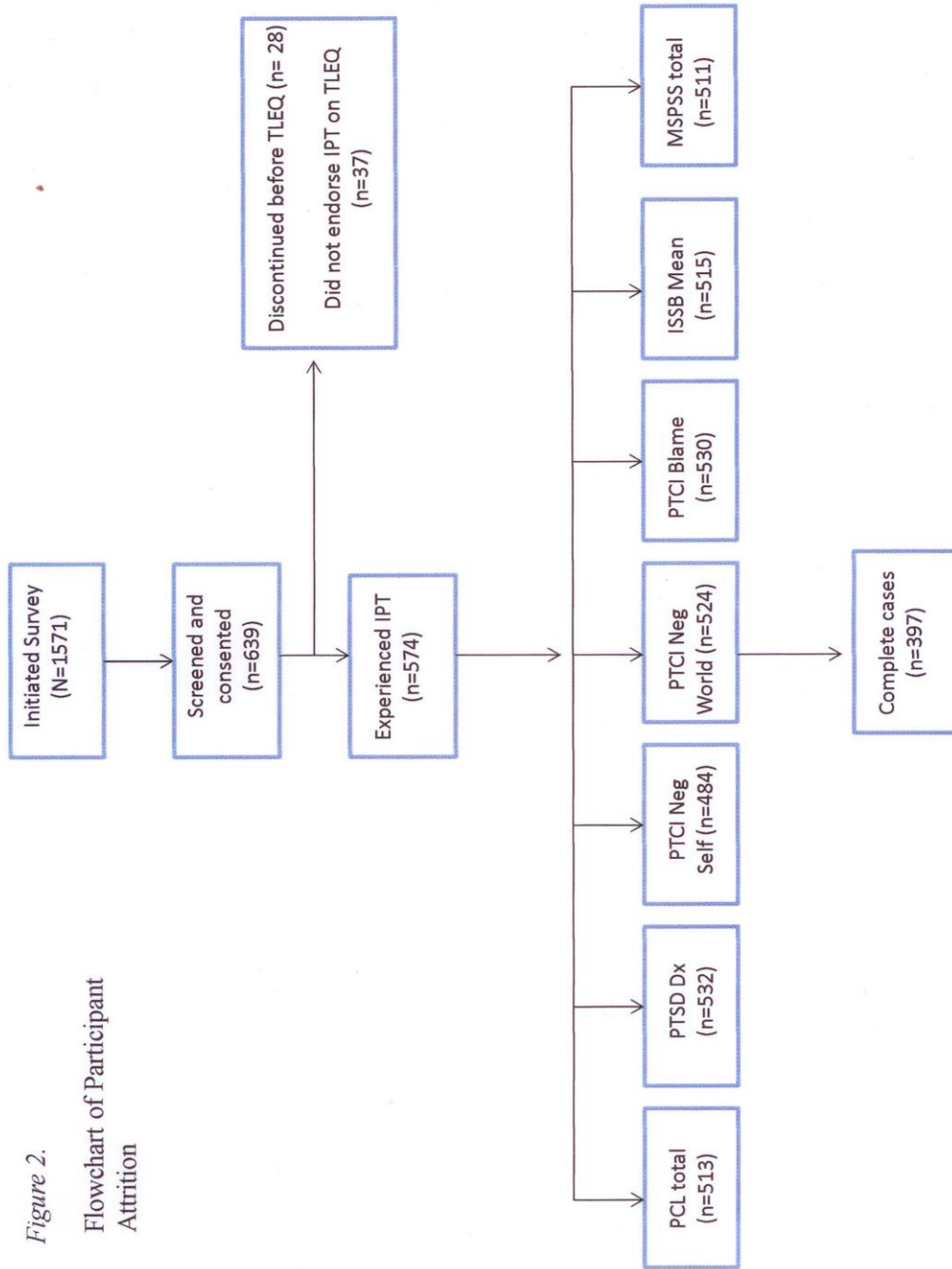
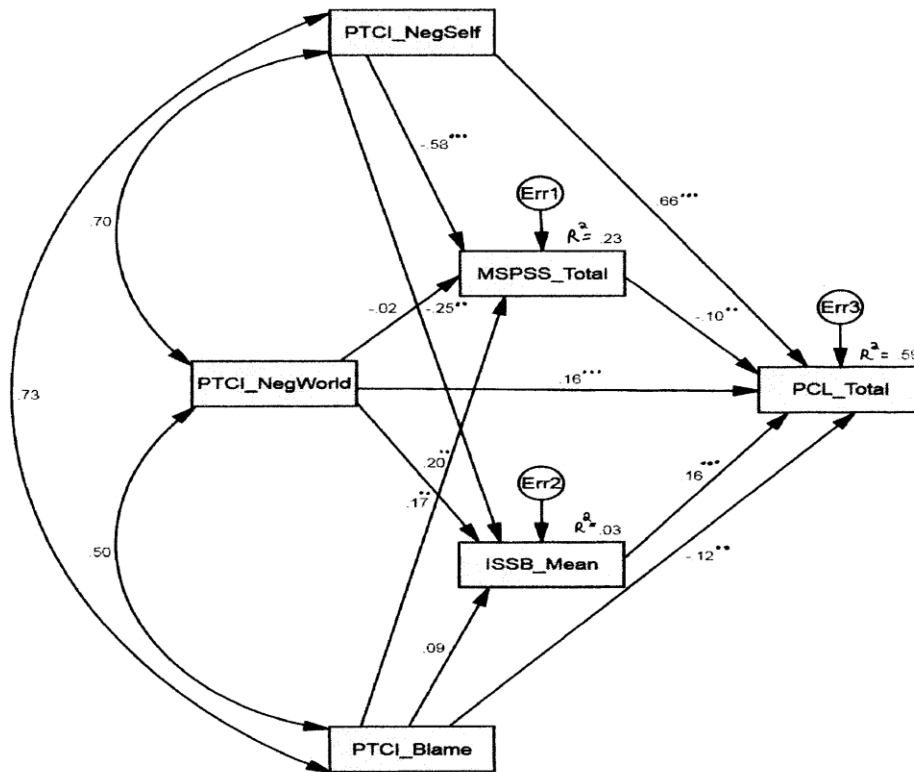


Figure 2.
Flowchart of Participant
Attrition

Figure 3.

Initial Path Model with Standardized Estimates



Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Figure 4.

Modified Path Model with Standardized Estimates

