ATTRIBUTIONS FOR DIFFERENT TYPES OF TRAUMATIC EVENTS AND

POSTTRAUMATIC STRESS AMONG WOMEN

by

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(Under the Direction of Joan Jackson)

ABSTRACT

The purpose of this study was to investigate the role of attributions in the development of posttraumatic stress symptoms among women after exposure to different types of traumatic events. Participants were 424 female undergraduates who previously experienced a serious accident, natural disaster, child abuse, or adult interpersonal violence. Two models were examined to test hypotheses regarding mediating and moderating effects. The first model employed path analysis, with results indicating a significant indirect pathway from event type to posttraumatic stress through global attributions. Interpersonal violence survivors exhibited the highest levels of global attributions and posttraumatic stress symptoms. The second model employed regression analyses, which revealed significant interactions between event type and attributions in predicting posttraumatic stress. Stable attributions were associated with increased symptoms in interpersonal violence survivors and decreased symptoms in natural disaster survivors. These findings have implications for identifying women at most risk for posttraumatic stress disorder, and for improving cognitive interventions for survivors of different types of traumatic events.

INDEX WORDS: Trauma, Traumatic Events, Attributions, PTSD, Posttraumatic Stress,

Cognition, Accident, Natural Disaster, Interpersonal Violence, Child Abuse, Domestic Violence,

Mental Health

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CHAPTER 1

INTRODUCTION

Overview

The experience of life-threatening, stressful, or traumatic events has been associated with

a number of adverse outcomes, including the development of posttraumatic stress disorder

(PTSD). The lifetime prevalence of PTSD in the population has been estimated at 7.8% (Kessler

Sonnega, Bromet, Hughes, & Nelson, 1995), with women being about twice as likely as men to

develop PTSD in response to a traumatic event (Breslau, Davis, Andreski, & Peterson, 1991;

Kessler et al., 1995). While 41-50% of women have been exposed to a potentially traumatic

event, only 18-31% develop PTSD (Creamer, Burgess, & McFarlane, 2001; Kessler et al. 1995;

Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993). The events associated with the highest

rates of PTSD among women involve violent assault, including rape (46%), physical abuse

(49%), and being threatened with a weapon (33%; Breslau et al. 1991; Kessler et al. 1995). This

variability in posttrauma adjustment suggests the presence of mediating or moderating factors.

Causal attributions that individuals make for negative life events have been proposed as

influential factors in posttrauma adjustment. Existing research has demonstrated a relationship

between self-blame and PTSD for multiple events. However, the findings are sometimes

contradictory and little research has examined other attributional dimensions, such as perceived

globality (generalizability) and stability (persistence) of causal factors, in relation to

posttraumatic stress. It is possible that attributions not only account for variability in response to

a particular event, but that they also help explain why certain events are more likely to lead to

PTSD than others. For example, detrimental attributions may be more common in response to some events than others. Alternatively, certain types of attributions (e.g., self-blame) could potentially have a different effect depending on the nature of the event. Understanding these relationships is of clinical significance, as attributions represent one of the few modifiable targets for intervention among trauma survivors. In addition, knowledge of these relationships could help identify individuals most at risk for PTSD. Women in particular may stand to benefit from advancements in this area, given their heightened vulnerability to PTSD.

The following review concentrates on the connections among traumatic events, cognition, and PTSD. It will first describe the syndrome of posttraumatic stress disorder. It will then discuss cognitive theories of PTSD and how attribution theory fits within this framework. Next, it will cover the empirical literature relating attributions to PTSD. Finally, it will review empirical findings that describe differences in attributional processes across traumatic events. This literature review leads to a discussion of the rationale and hypotheses for the current study.

<div align="center">Posttraumatic Stress Disorder</div>

Posttraumatic stress disorder involves the development of three types of symptoms following exposure to a traumatic event: a) persistent re-experiencing of the traumatic event (e.g., nightmares, flashbacks) b) persistent avoidance of stimuli associated with the event and numbing of responsiveness (e.g., avoiding trauma reminders, detachment from other people), and c) persistent symptoms of increased arousal (e.g., hypervigilance, irritability) (DSM-IV-TR, American Psychiatric Association, 2000). According to the Diagnostic and Statistical Manual of Mental Disorders (4th ed., text revision, American Psychiatric Association, 2000), a traumatic event may be defined as experiencing, witnessing, or confronting an event that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others.

Epidemiological studies estimate that a majority of individuals experience a traumatic event at some point in their lives (51-90%; Breslau et al., 1998; Kessler et al., 1995). The lifetime prevalence of PTSD in the general population has been estimated at 7.8% (Kessler et al., 1995), with women being about twice as likely as men to develop PTSD in response to a traumatic event (Breslau et al.1991, Kessler et al. 1995). Even when rape experiences, prior psychiatric histories, and prior trauma histories are controlled, women are more likely to develop PTSD in response to trauma than men (Breslau, Chilcoat, Kessler, & Davis, 1999; Breslau, Chilcoat, Kessler, Peterson, & Lucia, 1999; Kessler et al., 1995; Stein, Walker, & Forde, 2000). However, only 18-31% of women develop PTSD after experiencing a traumatic event (Creamer et al. 2001; Kessler et al. 1995; Resnick et al. 1993).

As only a portion of trauma-exposed individuals develop PTSD, investigators have attempted to identify risk factors and mechanisms that contribute to its onset. One important set of risk factors involves the nature and severity of the traumatic event. Individuals who were actually injured, or who feared that they would be injured or die, are more likely to experience psychological symptoms (Green, 1990; Kilpatrick et al., 1989; Resnick et al., 1993; Wirtz & Harrell, 1987). Perceived threat and injury are most frequently associated with physical assault and rape (Resnick et al., 1993). Similarly, the events associated with the highest rates of PTSD among women involve violent assault, including rape (46%), physical abuse (49%), and being threatened with a weapon (33%; Kessler et al. 1995; also see Breslau et al. 1991).Other risk factors for PTSD include prior mental illness (Cottler, Compton, Mager, Spitznagel, & Janca, 1992; Dikel, Engdahl, & Eberly, 2005; Kessler et al., 1995), younger age (Kilpatrick et al., 1989), history of prior trauma or childhood abuse (Brewin, Andrews, & Valentine, 2000;

Koopman et al., 2005), and negative social environments (Ullman & Filipas, 2001; Zoellner, Foa, & Brigidi, 1999).

<div align="center">Cognitive Theories and PTSD</div>

<div align="center">*Information-Processing and Social-Cognitive Theories*</div>

Another set of factors that are thought to heighten vulnerability to PTSD includes cognitive variables such as causal attributions for the traumatic event. The role of causal attributions may be explicated within the framework of information-processing and social-cognitive theories of PTSD. One prominent information-processing theory proposes that information is stored in fear networks, or schemata, that are activated in response to perceived threat (Beck & Emery, 1985; Chemtob, Roitblat, Hamada, Carlson, & Twentyman, 1988; Foa, Steketee, & Rothbaum, 1989). A schema has been defined as a knowledge structure involving a network of information that serves as a basis for directing attention, interpreting new information, and guiding future action (e.g., Fiske & Taylor, 1984; Williams, Watts, MacLeod, & Matthews, 1988). In response to traumatic events, fear networks, or cognitive schemata that organize information related to these events, are developed. These networks incorporate at least three types of information: stimulus information (e.g., sights and sounds), information about the person's emotional and physiological response to the event, and meaning information (e.g., perceived threat). It is theorized that future threat appraisal activates these networks, stimulating a search for further threat-relevant information. In the case of PTSD, it has been suggested that fear networks are easily activated and always at least weakly potentiated, creating an attentional bias towards threat cues (Chemtob et al., 1988; Litz & Keane, 1989). Attempts to avoid activation of the fear network account for the avoidance symptoms of PTSD (Foa et al., 1989).

It should be noted that a related theory, the "dual representation" theory of PTSD, also focuses on the cognitive mechanisms responsible for trauma-related symptoms (Brewin, Dagleish, & Joseph, 1996). According to this theory, autobiographical memories that are registered through conscious evaluations reflect the operation of a "verbally accessible memory" system or VAM. Information obtained through lower level perceptual processing that received little conscious attention (e.g., sights, sounds, physiological responses during the trauma) is stored in a parallel memory system called "situationally accessible memory"or SAM. PTSD is understood to develop as a result of two separate pathological processes, with VAM involving verbally accessible negative beliefs, and SAM involving involuntary flashbacks triggered by situational reminders of the trauma. Within dual representation theory, the concept of trauma-related schemata can be conceptualized as part of the VAM system.

According to both information-processing and social-cognitive theories, individuals are highly likely to engage in the process of schema change and development following traumatic events because these events introduce information that is incompatible with existing belief structures. In contrast to information-processing theories, social-cognitive theories focus more on personal and social context, the development of beliefs and emotions other than fear and perception of danger, and the long-term construction of schemata following the traumatic event. According to a highly influential social-cognitive model, victimization experiences result in the "shattering of an assumptive world (Janoff-Bulman & Frieze, 1983)." According to this model, the three assumptions that are challenged include: a) the belief in personal invulnerability; b) the perception of the world as meaningful and comprehensible; and c) the view of the self in a positive light. Other assumptions described in the literature include beliefs that a) the self is sufficiently competent to act, b) the world is sufficiently predictable, and c) the world provides

sufficient satisfaction of needs (Bolton & Hill, 1996). After traumatic experiences, individuals are motivated to redefine their assumptive worlds; the resulting schemata are expected to relate to corresponding emotional reactions and symptomatology.

According to information-processing theories, individuals may incorporate information about the traumatic event through at least two processes: a) assimilation (interpreting the information to fit with existing schemata) or b) accommodation (changing schemata to fit with the new information; Hollon & Garber, 1988; Resick & Schnicke, 1992). For example, a woman with the pre-existing belief "bad things only happen to bad people" may experience a schema-discrepant event such as rape and either assimilate the information ("I must have done something bad") or accommodate the information ("bad things sometimes happen to good people"). Furthermore, Resick and Schnicke (1992) propose that some trauma survivors engage in a process of "overaccommodation," or altering their beliefs to an extreme degree (e.g., "bad things are always happening to good people; I am not safe anywhere"). It is assumed that both assimilation and overaccommodation are the most likely processes to result in maladaptive adjustment to traumatic events.

Two types of maladaptive beliefs have been proposed to mediate the development of PTSD. The first of these involves a representation of the world as a pervasively threatening and unpredictable place, which may account for symptoms of hypervigilance and avoidance. For example, such a representation would result in a large number of environmental cues that could be perceived as threatening and therefore activate the trauma-related fear network (Chemtob et al., 1988; Foa et al., 1989). The second dysfunctional belief involves the perception of the self as totally incompetent, which limits survivors' ability to cope with the event. Some researchers have proposed that individuals with more rigid pre-trauma views, either positive (e.g., "the world

is extremely safe") or negative (e.g., "the world is extremely dangerous"), are most vulnerable to developing the negative schemata associated with PTSD (Foa & Riggs, 1993; Foa & Rothbaum, 1998).

Attribution Theory

Within the information-processing and social-cognitive models, causal attributions may be construed as cognitive coping strategies that are utilized in the redefinition of assumptive worlds. In other words, developing causal inferences about the perceived reason why an event has occurred is part of the process whereby survivors integrate schema-discrepant information. For example, the rape survivor from the previously described scenario that believes "bad things only happen to bad people" may search for a causal explanation of the event to integrate this information into her perceptions of the world as a comprehensible place (e.g., "I must have done something bad"). Theoretically, survivors of traumatic events are motivated to engage in the attributional process as a means of bringing meaning and organization into their lives after their cognitive frameworks have been disrupted (Janoff-Bulman, 1989).

Within the field of attribution research, four causal dimensions have been described: (a) locus, or whether the cause is internal or external to the individual, (b) stability, or whether the cause is constant or variable over time, (c) globality, or whether the cause is viewed as generalizable to many facts of life, and d) controllability, or whether the cause lies within the control of the individual (Abramson, Seligman, & Teasdale, 1978; Foa et al., 1989; Weiner & Graham, 1999). According to attribution theory, the attributions that individuals make for an event are closely linked to their emotional experiences and resulting actions. For example, an individual who attributes a negative event to internal, controllable causes tends to experience feelings of guilt and to attempt restitution. On the other hand, an individual that attributes the

negative event to internal, *uncontrollable* causes is likely to experience shame and to act in a retreating manner (Weiner & Graham, 1999). Attribution theory therefore provides a means of linking cognition, emotions, and behavior. Consequently, this theory has been of interest in investigating psychological adjustment and psychopathology. Most notably, the learned helplessness and hopelessness theories of depression predict that depression occurs when negative life events are attributed to internal, stable, and global causes (Abramson, Metalsky, & Alloy, 1989; Abramson, Seligman, & Teasdale, 1978).

Little has been done to elucidate the mechanisms by which attributions relate to posttraumatic symptoms. It has been argued that attributions made to factors under personal control might be associated with better adjustment, as a disruption in expectations of control is related to PTSD (Baum, Cohen, & Hall, 1993; Foa, Zinbarg, & Rothbaum, 1992). Janoff-Bulman argues that individuals who have been victimized often report self-blame (i.e. internal attributions) for victimization because it allows them to assimilate negative events while maintaining beliefs about personal control. She posits that behavioral self-blame (internal, unstable, specific attributions) serves an adaptive role in allowing victims to maximize their feelings of control. It allows for minimal change in beliefs about personal vulnerability and self-worth, as the individual would attribute the event to behavior that could be modified to prevent negative events in the future. In contrast, characterological self-blame, or blaming one's personal character (i.e., internal, stable, global attributions), is thought to have a negative impact on posttraumatic adjustment. These types of attributions would afford less of a sense of control and self-worth.

If the internal, stable, global pattern of attributions were associated with PTSD, then it would be comparable to the pattern described within the learned helplessness theory of

depression. In fact, the learned helplessness model has been applied to the experience of victimization, which is conceptualized as exposure to uncontrollable aversive events (Peterson & Seligman, 1983). The authors postulate that internal, stable, global attributions for these events result in feelings of helplessness and generalized beliefs about future uncontrollability. These responses are thought to account for the numbness and passivity among certain trauma victims. In addition to fitting with the learned helplessness model, this pattern of attributions aligns well with one of the core dysfunctional beliefs thought to account for PTSD: the perception of the self as entirely incompetent (Foa & Rothbaum, 1998).

While the internal, stable, global attributional style, due to its emphasis on internal attributions, may account best for the shame and guilt associated with posttraumatic stress reactions, it is conceivable that external attributions could also play a role. In fact, external attributions are more common in instances of perceived uncontrollability, and the original learned helplessness model states that one can feel either internally or externally helpless (Abramson, Seligman, & Teasdale, 1978). It is possible that attributing a traumatic event to *external*, stable, and global causes might relate to schemas construing the world as uncontrollable and therefore, to other symptoms of posttraumatic stress. This attributional pattern would align well with a second dysfunctional belief thought to account for PTSD symptoms: the belief that the world is completely dangerous (Foa & Rothbaum, 1998). A third possibility might entail attributions to unstable causes. Unstable attributions could be associated with perceived *unpredictability* of the world, which is also assumed to relate to PTSD (e.g., Foa, Steketee, & Rothbaum, 1989). Thus far, no particular set of attributions has been advanced as a compelling explanation for the development of PTSD.

Aside from attributions' relationships with perceived control, a second way that they may influence posttraumatic symptom development is through their relationship with emotional responses. PTSD has been associated with several types of emotions, including detachment, anger, guilt, confusion, humiliation, betrayal, and anxiety (Resick & Schnicke, 1992; Reynolds & Brewin, 1999). The emotions of shame and anger in particular have been associated with PTSD symptom development and delayed recovery (Andrews, Brewin, Rose, & Kirk, 2000; Feiring, Taska, & Lewis, 1998; Lehmann, 1997; Street & Arias, 2001). Attribution theory links internal attributions to shame, and empirical studies have found shame to mediate the relationship between internal attributions and PTSD (Feiring, Taska, & Chen, 2002; Feiring, Taska, & Lewis, 1996). Based on attribution theory, similar relationships among external attributions, anger, and PTSD would be suspected. However, these relationships have yet to be empirically tested.

A third way that attributions may contribute to PTSD symptom development is by affecting coping style. Attributing unpleasant events to uncontrollable and stable causes has been associated with greater use of passive and emotion-focused coping, as opposed to problem-focused coping (Mikulincer & Solomon, 1989; Peterson & Seligman, 1987). Problem-focused coping involves active attempts to solve stress-induced problems, and is negatively related to PTSD symptoms (e.g., Mikulincer & Solomon, 1989; Nezu & Carnevale, 1987). These findings are consistent with the learned helplessness model applied to victimization, wherein perceived helplessness leads to passive problem-solving. Therefore, attributions likely play a role in the cognitive, emotional, and behavioral processes that engender pathological responses to trauma.

Empirical Literature: Attributions and Post-trauma Adjustment

Multiple studies have empirically examined the role of attributions in responses to trauma. The majority of these studies have focused on outcomes such as depression or broad measures of psychological maladjustment (see reviews by Massad & Hulsey, 2006; Valle & Silovsky, 2002). Study populations have included survivors of natural disasters serious accidents, rape, domestic violence, child sexual abuse, child physical abuse, violent crime, combat, and loss of a relative (Massad & Hulsey, 2006; see Table 1). The most consistent findings indicate that internal, stable, and global attributions for negative events are associated with poor adjustment among trauma survivors. However, a few studies have discovered a relationship between external attributions and poor post-trauma adjustment (Brown & Kolko, 1999; McMillen & Zuravin, 1997; Frazier, 2000).

Of greatest relevance to this study, multiple empirical studies have analyzed the relationships between attributions and PTSD. Most of these studies have focused on the locus (internal-external) dimension of attributions. The majority of findings point to a positive relationship between internal attributions, or self-blame, and posttraumatic stress symptoms (see Table 1). However, several studies have documented a relationship between external attributions, or other-blame, and greater symptoms of PTSD (Arata, 1999; Delahanty et al., 1997; Jind, 2003; Hickling, Blanchard, Buckley, & Taylor, 1999; Frazier, 2000; Koss, Figueredo, & Prince, 2002; Mikulincer & Solomon, 1988; Williams, Evans, Needham, & Wilson, 2002). Some studies found no relationship between the locus of the attribution and PTSD (Gray & Lombardo, 2004; Wenninger & Ehlers, 1998).

It is not clear whether the contradictory findings regarding the relationship between the locus dimension of attributions and PTSD are due to measurement differences or to differences

between the sample populations. While the association between external blame and PTSD was more frequent among studies of accident survivors, these studies often measured attributions in terms of "fault" or "responsibility" for the event, as opposed to cause (Delahanty et al., 1997; Hickling et al., 1999;Williams et al., 2002). Shaver and Drown (1986) argue that responsibility, causality, and blame actually represent different constructs. The remaining studies linking external attributions to PTSD tended to measure external attributions as a separate construct from internal attributions, as opposed to endpoints on a continuum. One implication of these findings is that both external and internal attributions are involved in the development of PTSD.

While fewer studies have examined the dimensions of stability and globality, existing research suggests that more stable and global attributions are related to PTSD (Falsetti & Resick, 1995; Feiring et al., 1998; Gray & Lombardo, 2004; Gray, Pumphrey, & Lombardo, 2003; McCormick, Taber & Krudelback, 1989; Mikulincer & Solomon, 1988; Palker-Corell & Marcus, 2004; Wenninger & Ehlers, 1998; Wolfe, Gentile, & Wolfe, 1989). The majority of these studies measured these dimensions within a composite attributional style questionnaire, combining the locus, stability, and globality dimensions into a measure of "depressogenic" or "pessimistic" attributional style (e.g., Feiring et al., 1998; McCormick et al., 1989; Palker-Corell & Marcus, 2004) or combining the stability and globality dimensions into a measure of "hopelessness" (e.g., Gray et al., 2003). However, even when stability and globality dimensions were measured separately, they were each found to relate to symptoms of PTSD (Gray & Lombardo, 2004; Wenninger & Ehlers, 1998).

Studies that measured the locus, stability, and globality attributional dimensions differed in terms of whether they measured attributions as part of a general style (i.e., consistent way of responding to a variety of negative life events, sometimes hypothetical) or in terms of

attributions made for a specific traumatic event. Some studies have demonstrated a stronger relationship between event-specific attributions and PTSD, as opposed to general attributional style and PTSD (Falsetti & Resick, 1995; Gray et al., 2003). Falsetti and Resick (1995) suggest that PTSD symptoms may be more highly associated with attributions surrounding the traumatic event, whereas depression may result from similar negative attributions that become more pervasive and affect other areas of life. An alternative explanation is that individuals may depart from their typical attributional style when offering attributions for a traumatic event, making event-specific attributions more relevant than dispositional ones (Gray et al., 2003).

Another attributional dimension that has been assessed in the literature involves the perceived controllability of negative events. Perceived uncontrollability has been related to greater symptoms of PTSD among combat veterans (Ginzburg, Solomon, Dekel, & Neria, 2003; Mikulincer & Solomon, 1988) and crime victims (Falsetti & Resick, 1995; Kushner et al., 1992). These findings are consistent with the learned helplessness and information-processing theories, which explain PTSD as partially stemming from beliefs about an uncontrollable world. However, other studies have found perceived *controllability* to be related to PTSD (Joseph et al., 1991), or no relationship between controllability and PTSD (Jind, 2003; Joseph et al., 1993; Wenninger & Ehlers, 1998;Williams et al., 2002). These inconsistent findings may be due to the fact that study populations suffered from different types of traumatic events, which likely differed in the range of perceived controllability. For example, survivors of a cruise ship sinking largely attributed the event to uncontrollable factors, reducing any ability to detect a relationship between perceived controllability and PTSD (Joseph et al., 1993). Thus far, no known studies have systematically examined differences in perceived controllability between different types of traumatic events.

Factors Affecting Attributions for Traumatic Events

Little research has examined factors that might influence the types of attributions made for traumatic events. The majority of studies to report on these factors have focused on child sexual or physical abuse. From these studies, it appears that greater use of force or coercion, as well as more severe and frequent abuse, is associated with a greater likelihood of making external attributions (Chaffin, Wherry, & Dykman, 1997; Graziano, Lindquist, Kunce, & Munjal, 1992; Herzberger, Potts, & Dillon, 1981; Hunter, Goodwin, & Wilson, 1992; Ney, Moore, McPhee, & Trought, 1986; Tausch & Knutson, 1991; Wyatt & Newcomb, 1990). However, other studies have found greater severity of sexual activity to be positively related to self-blame (Coffey, Leitenberg, Henning, Turner, & Bennett, 1996; Morrow, 1991). While there is some evidence for a relation between distant child-perpetrator relationships and external blame (Chaffin, Wherry, & Dykman, 1997), others have found no association. Longer duration of child sexual abuse has been related to greater self-blame (Hoagwood, 1990; Quas, Goodman, & Jones. 2003; Steel, Sanna, Hammond, Whipple, & Cross 2004), as well as negative reactions and blame by others for the abuse (Chaffin et al., 1997; Hazzard, Celano, Gould, Lawry, & Webb, 1995). Research is still lacking regarding factors that influence attributions for traumatic events such as natural disaster, accidents, and adult interpersonal violence. In addition, little is known about factors that might influence an individual's tendency to make stable or global attributions.

The Role of Attributions across Traumatic Events

While a large body of research has demonstrated a relationship between attributions for negative events and vulnerability to PTSD, most studies have focused on survivors' reactions within the context of one type of traumatic event. Little work has attempted to determine whether the role of attributions differs depending on the type of event experienced. Research in this area

is necessary to establish whether attributions help account for the variable risk of developing

PTSD in response to different traumatic events (i.e. higher rates of PTSD for physical or sexual

assault).

Different Attributions for Different Events

One possibility is that exposure to certain events is more likely to elicit attributions that

contribute to PTSD (e.g., internal, stable, global). Some support for this option comes from

studies that have reported different frequencies of attributions for various traumatic events. It

appears that survivors of motor vehicle accidents and domestic violence report the highest levels

of external blame (64% for motor vehicle accidents, Hickling et al., 1999; 72-76% for domestic

violence, Cantos, Neidig, & O'Leary, 1993; also see Andrews & Brewin, 1990; Cascardi &

O'Leary, 1992; Holtzworth-Monroe, 1988). Findings regarding external blame for child sexual

abuse remain equivocal. While one study of female adolescent incest survivors reported

frequency of perpetrator blame as 33% (Morrow, 1991), a second study of male and female

adolescent child sexual abuse victims reported frequency of perpetrator blame to be 75%

(Hunter, Goodwin, & Wilson, 1992). Other studies found rates of external attributions to be

higher than rates of internal attributions for rape, natural disaster, and child abuse (Branscombe

et al., 2003; Frazier, 2000; Greening et al., 2002; Kolko, Brown, & Berliner, 2002; Perrott,

Morris, Martin, & Romans, 1998; Solomon et al., 1989). However, these studies did not report

frequencies of different attributions, preventing comparison across different events.

It is unclear which events elicit the highest levels of self-blame. The reported frequency

of self-blame for child sexual abuse varied widely between two studies, from 17% of adolescent

incest victims (Morrow, 1991) to 46% of women retrospectively reporting on past child sexual

abuse experiences (Wyatt & Newcomb, 1990). One study has indicated the frequency of self-

blame for rape to be 50% (Meyer & Taylor, 1986). The reported frequency of self-blame for domestic violence ranged from 12% to 38% (Cantos et al., 1993; Cascardi & O'Leary, 1992; Frieze, 1979). In comparison, a lower frequency of self-blame has been described among motor vehicle accident survivors (9%, Hickling et al., 1999). No known studies have reported frequencies of either external or internal attributions for natural disasters.

Few studies have examined relative rates of attributions along the stability and globality dimensions. One study of cruise ship accident survivors discovered that participants were most likely to attribute the cause to unstable, specific factors (Joseph et al., 1993). Some studies of domestic violence victims found that participants were most likely to attribute the cause to unstable factors (see Holtzworth-Monroe, 1988). Indirect evidence for different attributional tendencies between victims of interpersonal violence and accidents may be derived from the finding that victims of assault perceive themselves as more incompetent and the world as more dangerous, in comparison to accident victims (Foa, Ehlers, Clark, Tolin, & Orsillo, 1999). This suggests that victims of assault may be more prone to global, stable forms of attributions. In general, lack of data in this area precludes any comparison between different types of traumatic events in terms of global and stable attributions.

Differential Effects of Attributions across Events

A second explanation for differential rates of PTSD across traumatic events is that the impact of attributions on symptoms may differ depending on the event. It has been argued that when the consequences of a negative event are lower, the loss of self-esteem through blaming oneself is likely to be lessened. Conversely, when the outcome severity is high, self-blame may lead to increased sense of vulnerability and lowered self-esteem (Macleod, 1999). In a related argument, it has been suggested that behavioral self-blame (internal, unstable, specific

attributions) may be more adaptive in cases where individuals feel that they might have control over future occurrences of a similar event, such as in the case of motor vehicle accident survivors (Greening et al., 2002). However, the internal, unstable, specific attributional pattern may be maladaptive in cases of high severity and low controllability; in these cases, the problem-focused coping strategies that are associated with this attributional style have been found to be less effective (Forsythe & Compas, 1987; Frazier & Schauben, 1994). In such instances, the guilt and shame associated with self-blame may outweigh any potential adaptive effects of perceived control.

Support for these arguments comes from discrepant findings regarding the effects of internal, unstable, specific attributions and self-blame in general. Some studies have found the internal, unstable, specific pattern to be associated with better posttraumatic adjustment (Affleck, McGrade, Allen, & McQueeney, 1985; Baum, Fleming, & Singer, 1983; Bulman & Wortman, 1977; Janoff-Bulman, 1982; Koss, Figueredo, & Prince; Schulz & Decker, 1985; Tennen, Affleck & Gershman, 1986) while others have found this attributional pattern to be related to poor adjustment (Arata, 1999; Jind, 2003; Frazier, 1990; Frazier & Schauben, 1994; Hill & Zautra, 1989; Meyer & Taylor, 1986). Overall, it appears that the studies supporting a negative effect of internal, unstable, specific attributions focused on more severe life events, often involving incidents of interpersonal violence (e.g., rape as opposed to accidents or physical disabilities). It also seems that in these cases, the stability and globality dimensions did not relate to outcomes. However, further research that examines these dimensions separately would be necessary to determine what role they play in responses to different negative events.

Studies that examined the locus dimension separately found similar results to those described above. Research with motor vehicle accident survivors has found that individuals who

hold themselves responsible suffer from fewer symptoms of PTSD (Delahanty et al., 1997;

Hickling et al., 1999; Williams et al., 2002), although studies of other types of accident victims

have reported contradictory results (Joseph, Brewin, & Yule, 1991; Joseph, Brewin, Yule, &

Williams, 1993; Victorson, Farmer, Burnett, Oullette, & Barocas, 2005). In comparison, internal

attributions for events such as sexual assault and violent crime are repeatedly associated with

worse outcomes (see Table 1). While far from consistent, these trends suggest that self-blame

may serve an adaptive function with less severe and/or more controllable events and play a

detrimental role with more severe and/or uncontrollable events.

While the findings regarding differential effects of self-blame may be related to

differences between traumatic events, they may also be related to measurement biases. Some

measures ask participants to rate their agreement with statements reflecting self-blame, while

others ask participants to rate the perceived cause of the event on dimensions such as internal-

external, stable-unstable, and global-specific. As discussed previously, still others assessed

perceived "responsibility" or "fault." Although the terms "self-blame," self-responsibility, and

internal attributions of causality are used interchangeably in the literature, it is possible that they

represent different constructs.

Another possibility that could account for differential rates of PTSD is that certain

attributions could have more or less of an effect on PTSD depending on the event (although the

relationships may be in the same direction). For example, internal, stable, global attributions may

have a highly detrimental effect on posttraumatic adjustment for survivors of interpersonal

violence and minor negative effects on adjustment for survivors of accidents and natural

disasters. While no known studies have directly compared the magnitude of the attributional

effect on PTSD across events, a survey of studies examining events in isolation suggests the

following effect sizes: a) natural disasters: $r = .26-.35$, mean = .31; b) accidents: $r = .28-.57$, mean = .45; c) domestic violence: $r = .27-.58$, mean = .48; d) rape: $r = .26-.41$, mean = .32; e) child abuse: $r = .15-.60$, mean = .30. Based on these results, it appears that there may not be a large difference between events regarding the effects of attributions on PTSD. Again, it is difficult to draw conclusions since existing studies demonstrate a great deal of variability in methodology and effect sizes. Further research using consistent assessment of attributional dimensions is necessary to determine whether their effects truly differ across traumatic events.

Summary

In sum, the rates of PTSD differ across traumatic events, with sexual and physical assault resulting in higher rates than accidents and natural disasters. Cognitive factors may help explain the relationships among traumatic events and PTSD. Information-processing and social-cognitive theories propose that the experience of trauma is likely to result in schema change. Maladaptive schema change, such as the development of beliefs that the world is threatening and that the self is incompetent, may increase vulnerability to PTSD. Attributions likely play a role in schema development following traumatic events. For example, attributions to internal, unstable, specific causes could help foster a belief in personal control. On the other hand, attributions to stable and global causes could contribute to perceptions of helplessness and uncontrollability. Attributions for traumatic events may also play a role in emotional responses and coping styles that relate to posttraumatic symptoms. While empirical studies have investigated the role of attributions in the development of PTSD, the nature of this role remains unclear. For the most part, findings indicate that internal, stable, and global attributions are associated with heightened PTSD symptom severity. However, some studies have demonstrated adaptive effects for internal attributions and for a pattern of internal, unstable, and specific attributions.

Given that attributions seem to play a role in PTSD, they may account for the varying response across traumatic events. At least two possibilities are suggested by theoretical and empirical literature in this area. One possibility is that detrimental attributions (e.g., internal, stable, global) are more frequent among events associated with higher rates of PTSD (e.g., interpersonal violence). A second possibility is that attributions have a different effect depending on the event. For example, an internal, unstable, specific attributional pattern may be adaptive for accident survivors and maladaptive for survivors of interpersonal violence. Attributions have generally been measured in an inconsistent fashion and few studies have examined the effects of attributional dimensions separately. Furthermore, no known studies have examined differential rates of attributions, or potential differential effects across traumatic events. Therefore, additional research in this area is necessary to elucidate the complex roles that attributions may play in the development of posttraumatic symptoms.

Table 1

Results of Studies Examining Relationships between Attributions and PTSD

Study population	**Attributional dimensions measured**	**Attributions associated with PTSD symptoms**
Natural Disaster		
Greening, Stoppelbein, & Docter (2002) Earthquake survivors	Locus Stability Globality (dispositional) Event-specific behavioral and characterological self-blame	Behavioral self-blame Characterological self-blame Composite internal, stable, global
Solomon, Regier, & Burke (1989) Floods and resulting chemical exposure	Self-blame Other-blame (event-specific)	Self-blame
Accidents		
Delahanty et al. (1997) Motor vehicle accidents	Responsibility of self vs. others	External
Hickling, Blanchard, Buckley, & Taylor (1999) Motor vehicle accidents	Responsibility of self vs. others	External
Joseph, Brewin, Yule, & Williams (1991) Ferry capsizing	Locus, controllability (event-specific)	Internal
Joseph, Brewin, Yule, & Williams (1993) Cruise ship sinking	Locus, controllability, stability, globality (event-specific)	Internal
Lambert, Difede, & Contrada (2004) Hospitalized burn victims	Locus (event-specific)	External
Victorson, Farmer, Burnett, Oullette, & Barocas (2005) Traumatic physical injury	Self-blame coping	Self-blame
Williams, Evans, Needham, & Wilson (2002) Traumatic brain injury (primarily following MVAs)	Ratings of fault (internal to external) Ratings of whether event could have been avoided	External

Study population	Attributional dimensions measured	Attributions associated with PTSD symptoms
Crime Victims		
Falsetti & Resick, 1995 various	Locus Stability Globality Controllability (dispositional)	Internal, stable, uncontrollable
Harrison & Kinner (1998) Armed robbery	Vulnerability (perceived likelihood that it would happen to you vs. someone else; stability of cause)	Vulnerability attributions
Kushner, Riggs, Foa, & Miller (1992) Criminal assault	Controllability (during assault, over future assault, over aversive events generally)	Uncontrollability over aversive events, general
Domestic Violence		
Lehmann (1997) Child witnesses to mother assault	Personal vulnerability Dangerous world Self-blame	Personal vulnerability Dangerous world Self-blame
Palker-Corell & Marcus (2004)	Locus Globality Stability (composite, dispositional) Global/Stable (dispositional, composite hopelessness) Global/Stable (event-specific, composite hopelessness)	Internal, global, stable (composite dispositional) Global/stable (event-specific, composite hopelessness)
Rape		
Arata (1999)	Characterological self-blame Behavioral self-blame Societal blame	Characterological self-blame Behavioral self-blame Societal blame
Frazier (2000)	Behavioral self-blame Characterological self-blame External blame	External blame Characterological self-blame Behavioral self-blame
Koss, Figueredo, Prince (2002)	Behavioral self-blame Characterological self-blame External blame	Characterological self-blame, external blame
Meyer & Taylor (1986)	Characterological self-blame Behavioral self-blame Societal blame	Characterological blame (predicting fear)

Study population	Attributional dimensions measured	Attributions associated with PTSD symptoms
Regehr, Cadell, & Jansen (1999)	Poor judgment (behavioral self-blame) Societal factors Victim type (characterological self-blame)	No relationship
Child Sexual/Physical Abuse		
Barker-Collo (2001) CSA	Locus Globality Stability	Internal
Barker-Collo, Melnyk, & McDonald-Miszczak (2000) CSA	Locus	Internal
Brown & Kolko (1999) CPA	Internal External	Internal (predicting internalizing anxiety symptoms and abuse fear)
Feinauer & Stuart (1996) CSA	Self-blame Blaming fate or luck	Self-blame Fate
Feiring et al. (2002) CSA	Mother-blame	Mother-blame
Feiring et al. (1998) CSA	Locus, stability, globality (composite/dispositional)	Internal, stable, global
Owens & Chard (2001) CSA	Self-blame	Self-blame
Wenninger & Ehlers (1998) CSA	Locus Stability Globality Controllability (dispositional)	Global
Wolfe, Gentile, & Wolfe (1989) CSA	Locus Stability Globality (dispositional)	Stable, global
Bereavement		
Jind (2003) Loss of an infant	Behavioral self-blame Characterological self-blame Externality Chance (control over past)	Behavioral self-blame Characterological self-blame External
Boelen, van den Bout, & van den Hout (2003) Loss of first degree relative	Self-blame	Self-blame (related to traumatic grief)

Study population	Attributional dimensions measured	Attributions associated with PTSD symptoms
Combat		
Ginzburg, Solomon, Dekel, & Neria (2003)	Locus Stability Controllability (dispositional)	Internal, unstable, uncontrollable
Mikulincer & Solomon (1988)	Locus Stability Controllability (dispositional)	External, stable, uncontrollable
Unspecified/Various		
Gray & Lombardo (2004)	Locus Stability Globality (dispositional)	Global Stable/global composite
Gray, Pumphrey, & Lombardo (2003)	Locus Stability Globality Stable/Global (composite hopelessness scale) Composite negative (internal, global, stable) (dispositional and event-specific)	Internal, stable, global (individual and composite) Stable/Global (composite hopelessness scale) (both dispositional and event-specific)
McCormick, Taber, & Kruedelbach (1989) Veterans treated for alcohol and gambling	Locus Globality Stability (composite dispositional)	Internal, stable, global

CHAPTER 2

RATIONALE AND HYPOTHESES

The purpose of this study was to investigate the relationships among traumatic events, causal attributions, and symptoms of posttraumatic stress disorder among women. The overarching research question for this study was: What role do attributions play in the development of PTSD symptoms after exposure to different types of traumatic events? Specific questions that addressed this inquiry included: a) Do events differ in their likelihood of eliciting particular types of attributions that, in turn, account for variability in PTSD symptoms? and b) Do attributions have a different impact, depending on the event?

Significance

These questions are significant for several reasons. PTSD has been described as among the two most substantial causes of burden of disease by psychological disorders (Kessler & Frank, 1997). It has been associated with occupational dysfunction, physical health problems, and additional psychological problems such as depression and substance use (see Breslau, 2002; Kilpatrick & Acierno, 2003; McFarlane, 2004). Therefore, information that could contribute to alleviation of PTSD symptoms could have a significant, widespread impact.

Examining cognitive factors associated with the development of PTSD is of value for at least two reasons. First, since not everyone exposed to a traumatic event will develop PTSD, it is important to identify which individuals may be most at risk. Existing research suggests that attributions represent a potential risk factor. Second, cognitive factors represent one of the few modifiable targets for intervention. Understanding the role of attributions may help improve the

effectiveness of interventions designed to alleviate symptoms of PTSD. In sum, understanding how the role of attributions differs across traumatic events could assist in more precise estimates of PTSD vulnerability, as well as more effectively tailored interventions. These findings have potential widespread applicability, as the majority of the population has been exposed to a traumatic event at some point in their lives. Women in particular may stand the most to benefit from research in this area, given their heightened risk for developing PTSD.

Constructs

Traumatic Events

Exposure to a traumatic event was defined according to the DSM-IV-TR (American Psychiatric Association, 2000) definition as experiencing, witnessing, or confronting an event that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others. The events measured in this study included: a) experiencing or witnessing a serious industrial, farm, or car accident; b) experiencing a natural disaster (e.g., tornado, hurricane, flood, or major earthquake); c) experiencing interpersonal violence (IPV) in adulthood (e.g., rape, robbery, sexual/physical assault); and d) child physical or sexual abuse. These events represent some of the more widely studied events in the literature, as well as the most frequent events in the current dataset. Since participants may have experienced multiple traumatic events, they were asked to identify one event that was most traumatic for them. These events were the focus of the current study, as events that were perceived as most threatening have been found to be better predictors of PTSD (Resnick et al.,1993).

Attributions

Three attributional dimensions were the focus of this study: a) locus, b) stability, and c) globality. These represent the most widely validated constructs in the literature. In addition, it

has been argued that these dimensions are more effective in predicting pathological states, in comparison to Weiner's original model (i.e., locus, stability, controllability; Amirkhan, 1998; Weiner & Graham, 1999). Two composite terms, comprised of the three attributional dimensions, were also examined: a) an internal, stable, global composite and b) an internal, unstable, specific composite. These composite terms reflect the attributional patterns most frequently examined within the literature. This study analyzed attributions made for the most traumatic event, since event-specific attributions have been found to relate most strongly to PTSD (Falsetti & Resick, 1995; Gray et al., 2003).

Posttraumatic Stress

PTSD symptoms were defined according to the symptoms listed in the DSM-IV-TR (American Psychiatric Association, 2000). These include: a) persistent re-experiencing of the traumatic event (e.g., nightmares, flashbacks) b) persistent avoidance of stimuli associated with the event and numbing of responsiveness (e.g., avoiding trauma reminders, detachment from other people), and c) persistent symptoms of increased arousal (e.g., hypervigilance, irritability). These symptoms were defined in reference to the events identified as most traumatic by the participants. Posttraumatic stress was measured in a continuous fashion, as opposed to identifying participants who met criteria for all three symptom clusters.

Hypotheses

Two models were examined in an attempt to examine the role of attributions in the development of posttraumatic stress across different types of traumatic events. In the first model, attributions were proposed to play a mediational role between the type of event and PTSD symptoms. In the second model, the type of event was proposed to play a moderational role, with

attributions having a different impact on PTSD symptoms depending on the type of event experienced.

Model 1

The first set of hypotheses proposed that the type of event experienced indirectly exerts an effect on PTSD symptoms through event-specific attributions (see Figure 1). It was first expected that interpersonal violence during either childhood or adulthood would be related to higher rates of PTSD symptoms, in comparison to natural disasters and accidents. This was based on epidemiological studies that found events such as rape, physical assault, and physical abuse to be associated with greater likelihood of developing PTSD among women (Breslau et al. 1991; Kessler et al., 1995). Second, it was expected that the type of attributions would differ depending on the type of traumatic event. Third, it was hypothesized that internal, stable, and global attributions would generally be associated with increased symptom levels. This hypothesis was based on prior empirical studies, as well as information processing and learned helplessness theories of PTSD.

Regarding differences in the type of attributions elicited by certain events versus others, it was expected that survivors of interpersonal violence during either childhood or adulthood would make more internal, stable, and global attributions in comparison to survivors of accidents or natural disasters. This was based on prior findings that self-blame is more frequent among rape, domestic violence, and child sexual abuse survivors in comparison with motor vehicle accident survivors (Cantos et al., 1993; Frieze, 1979; Hickling et al., 1999; Meyer & Taylor, 1986; Morrow, 1991; Wyatt & Newcomb, 1990). It was also based on data demonstrating that victims of assault perceive themselves as more incompetent and the world as more dangerous, in comparison with accident victims (Foa et al., 1999). While there were no empirical findings to

suggest differences between survivors of natural disasters versus survivors of interpersonal violence, it was expected that the widely accepted environmental causes for natural disasters would predominantly lend themselves to external attributions. It was unclear whether individuals would be more likely to consider the cause of interpersonal violence to be more stable (present again, should the event recur) or global (affecting other areas of life), in comparison to natural disasters. However, the current set of hypotheses was also based on the fact that higher levels of posttraumatic stress were expected among survivors of interpersonal violence. Since internal, stable, and global attributions are generally positively associated with PTSD symptoms within the literature, it was expected that interpersonal violence would elicit higher levels of these types of attributions.
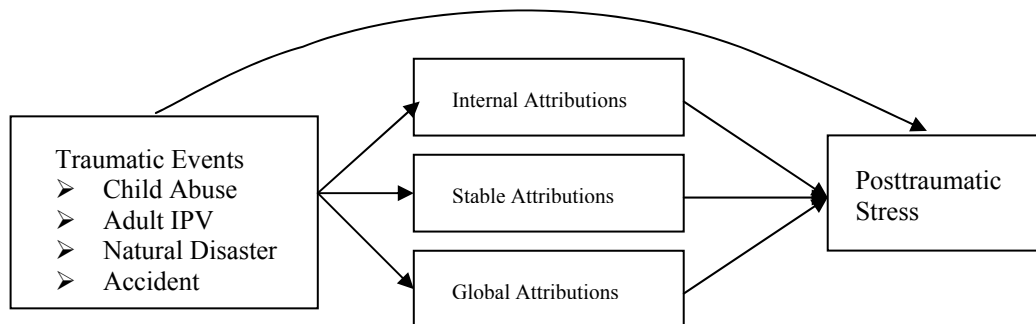
Figure 1. Conceptual model for Model 1: Mediating role of attributions

Two additional models were proposed to explore the potential mediational roles of two composite attributional patterns: a) an internal, stable, global pattern, and b) an internal, unstable, specific pattern. These composite patterns were chosen based on the patterns that are most frequently examined in the literature. It was expected that the type of event would exert an indirect effect on posttraumatic stress through one or both composite attributional patterns. Specifically, it was hypothesized that interpersonal violence would be associated with higher

levels of internal, stable, global attributions, which would in turn be associated with greater symptoms of PTSD. No hypotheses were made regarding the association between internal, unstable, specific attributions and event type due to lack of evidence in the literature. Similarly, hypotheses were not generated regarding the relationship between internal, unstable, specific attributions and PTSD symptoms due to equivocal findings among prior studies. Therefore, the second of these two models (evaluating the internal, unstable, specific pattern) was more exploratory in nature.

Model 2

The second set of hypotheses proposed that the impact of attributions on PTSD symptoms would differ depending on the traumatic event (see Figure 2). It was expected that a combination of internal, unstable, and specific attributions (behavioral self-blame) would be negatively related to PTSD symptoms for accident survivors, but positively related to symptoms for survivors of interpersonal violence in childhood or adulthood. These hypotheses were based on prior empirical studies that demonstrated an adaptive effect for an internal, unstable, specific attributional pattern or internal causal attributions among accident survivors (e.g., Bulman & Wortman, 1977; Delahanty et al., 1997; Hickling et al., 1999), and a maladaptive effect among survivors of interpersonal violence (e.g., Arata, 1999; Frazier, 2000). These hypotheses were also based on two theoretical assumptions: a) that internal, unstable, and specific attributions would be more effective for individuals experiencing events over which they may have future control (Greening et al., 2002), and b) that individuals who blame themselves for severe events with high interpersonal consequences may feel more vulnerable, guilty, and ashamed (Macleod, 1999). Based on existing data, it was difficult to generate hypotheses regarding the differential impact of attributions on survivors of natural disasters. However, based on the second assumption stated

above, it was anticipated that internal attributions would have less of an effect on PTSD symptoms among this population, in comparison to survivors of interpersonal violence. Due to mixed or insufficient findings to inform these hypotheses, Model 2 was considered more exploratory in nature.

Although the literature primarily discusses the potential opposite effects of the internal, unstable, specific attributional pattern, there were other possibilities for a moderating effect of trauma type on the relationship between attributions and posttraumatic stress. It was conceivable that certain attributions would simply have more or less of an effect on PTSD symptoms depending on the event (although the relationships could be in the same direction). For example, internal, stable, global attributions could have a highly detrimental effect on posttraumatic adjustment for survivors of interpersonal violence and minor negative effects on adjustment for survivors of accidents and natural disasters. Again, there was little evidence for this phenomenon from the literature, so these analyses were considered exploratory.
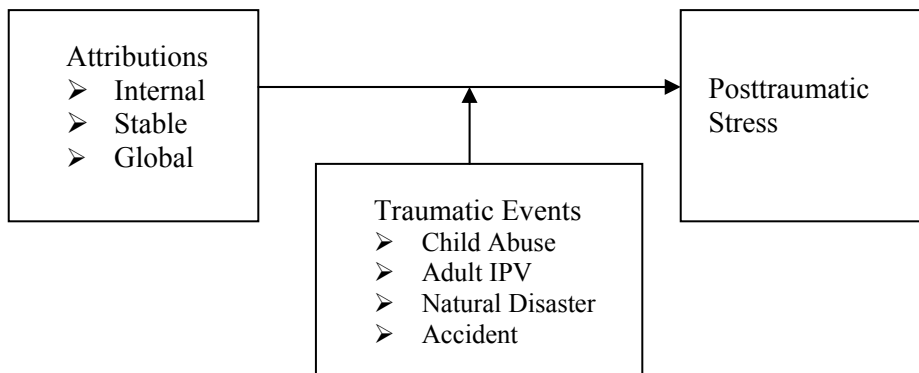
Figure 2. Conceptual model for Model 2: Moderating effects of event type

It was considered possible that one or both of the two proposed models could help account for the differential rates of PTSD across traumatic events. If both models were true, one might conclude that survivors of interpersonal violence not only make more harmful types of attributions, but that these attributions also have a more negative impact on this population in comparison to others. Furthermore, what might be adaptive forms of attributions (e.g., unstable, specific) may have little effect on symptoms among survivors of interpersonal violence in comparison to other trauma-exposed individuals.

CHAPTER 3

METHOD

Participants and Procedure

The study relied on an existing dataset obtained from a sample of 1372 female

undergraduates (Zinzow & Jackson, 2004; Zinzow & Jackson, 2005; Zinzow, Seth, Jackson,

Furr, & Fitzgerald, 2005). Participants were enrolled in introductory psychology courses and

recruited through the research participant pool. They received course credit for their

participation. They completed self-report questionnaires including measures of demographic

information, trauma histories, religiosity, attributions for traumatic events, and psychopathology.

Participants for the current study were selected based on their responses to the Traumatic Events

Questionnaire (see below). Participants' indication that they experienced a serious accident,

natural disaster, adult interpersonal violence, or child abuse served as the basis for inclusion in

the study. Analyses focused on the events identified as most traumatic by the participants. For

the purposes of a prior study, individuals with histories of child sexual abuse were asked to

respond to certain measures in terms of their experiences of child sexual abuse, regardless of

whether or not child sexual abuse was identified as the most traumatic event. Because the current

study focused on participants' responses to the most traumatic event identified, individuals with

a history of child sexual abuse who did *not* identify child sexual abuse as the most traumatic

event were excluded.

Measures

Traumatic Events Questionnaire (TEQ; Vrana & Lauterbach, 1994)

The TEQ assessed experiences with nine types of traumatic events: serious accidents, natural disasters, violent crime, child physical or sexual abuse, adult sexual assault, domestic violence, witnessing mutilation/injury/death, dangerous/life-threatening situation, and receiving news of mutilation/injury/death of a loved one. Participants were also asked to rate each event on four 7-point scales, indicating the extent to which they were injured, felt their lives were threatened, perceived the event to be traumatic at the time, and perceived the event to be traumatic at the time of assessment. Finally, participants were asked to identify the event that they perceived to be the "most traumatic." The current study focused on the following events: serious accidents, natural disaster, adult interpersonal violence, and child abuse. The event identified as "most traumatic" was used to define groups of participants. To obtain a measure of exposure to adult interpersonal violence, the item assessing violent crime (such as rape, robbery, and assault) was combined with the items assessing adult sexual assault and domestic violence. To assess event severity, the two items measuring injury and perceived life threat were summed for the event identified as most traumatic (potential range on this item was 2 to 14). For a measure of variety of events experienced, the number of events endorsed on the TEQ was summed (for a potential range of 0 to 11).

Attributional Style Questionnaire (ASQ; Peterson et al., 1982)

This instrument was used to measure attributions for traumatic events. The ASQ is a self-report measure in which participants specify the "one major cause" of the event, and then rate the degree to which the cause was a) internal versus external, b) stable versus unstable, and c) global versus specific. The three attributional dimensions are measured on a 7-point scale, with higher

scores representing more internal, stable, or global attributions. The dimensions can either be examined separately or summed into a composite score. However, the authors recommend that if composite scores are to be used, the items should be normalized (i.e. subtracting the item mean from the item score and dividing by the item's standard deviation for the sample); this avoids differentially weighting scales with discrepant means. For this study, two composite scores were created: a) a score representing internal, stable, global attributions and b) a score representing internal, unstable, specific attributions (the stability and globality dimensions were reverse scored and then normalized before summing with the normalized internal dimension).

Construct validity for the ASQ has been demonstrated by significant correlation with content analysis of spontaneously generated attributions (Schulman, Castellon, & Seligman, 1989). The ASQ has also demonstrated a significant relationship with symptoms of depression and anxiety (e.g., Corr & Gray, 1996; Ostell & Divers, 1987; Robins, 1988). Confirmatory factor analysis supports the validity of the three dimensions (locus, stability, globality; Hewitt, Foxcroft, & Macdonald, 2004). In the original format, participants are asked to respond to hypothetical negative and positive events. In order to obtain event-specific attributions, the scale was modified to ask participants to respond to the most traumatic event they experienced, as identified by the TEQ. This modification has been applied in a previous study of female survivors of sexual abuse, with adequate internal consistency reliability (alpha = .78; Barker-Collo, Melnyk, & McDonald-Miszczak, 2000).

Purdue PTSD Scale-Revised (PPTSD-R; Lauterbach & Vrana, 1996)

This instrument was used as a measure of PTSD symptomatology among the sample population. The PPTSD-R is a self-report measure comprised of 17 items corresponding to the symptoms found within PTSD criteria B, C, and D in the DSM-IV. Respondents rated the

frequency of occurrence within the previous month of each item on a five-point scale ranging from 1 (not at all) to 5 (often). In the context of this study, participants were asked to rate their responses in relation to the event they identified as most traumatic from the TEQ. The scale can be scored to yield a dichotomous index of PTSD, or to yield a continuous measure of severity. Continuous scores are obtained by summing the 17 items, for a total score ranging from 17 to 85. The diagnosis of PTSD requires the endorsement of at least one reexperiencing (criterion B) symptom (items 1-4, 8), three avoidance (criterion C) symptoms (items 5-7, 9-12) and two arousal (criterion D) symptoms (items 13-17). This study used the continuous measure in the interest of representing maximum variability within the construct of PTSD.

The PPTSD-R has demonstrated excellent internal consistency overall ($\alpha = .91$) and very good internal consistency for the symptoms subscales ($\alpha = .79$ to .84; Lauterbach & Vrana, 1996). Within the current study sample, Cronbach's α was .92. Test-retest reliability for 51 undergraduate students over two weeks reflected adequate stability in the total score ($r = .72$). In terms of validity, the PPTSD-R has exhibited a stronger relationship with other measures of PTSD symptomatology ($r = .50$ to $r = .66$) than with measures of anxiety ($r = .37$) and depression ($r = .39$). Further, students who experienced at least one traumatic event scored higher than those who did not report any traumatic events (Lauterbach & Vrana, 1996). In addition, individuals with a history of sexual abuse scored significantly higher than nonvictims (Timmons-Mitchell, Chandler-Holtz, & Semple, 1996), and Vietnam veterans with more combat experience and higher distress have been shown to score higher on the PPTSD-R (Hendrix, Anelli, Gibbs, & Fournier, 1994).

Analysis Plan

Model 1: Mediating Role of Attributions

To test whether there were significant indirect pathways from type of event to posttraumatic stress through attributions, path analysis was employed. This technique was chosen for its ability to simultaneously examine the influence of multiple intervening variables within a theoretical model of causal relationships among variables (see Klem, 1995). In the first set of analyses, the unique intervening effects of each of the three attributional dimensions (locus, stability, globality) were examined within the context of the other two attributional dimensions. The exogenous variable was type of traumatic event and the endogenous variables were the three attributional dimensions and posttraumatic stress (see Figure 1 for diagram). Two similar path models were examined to determine the roles of the two composite attributional measures (internal, stable, global and internal, unstable, specific), in contrast to examining each dimension separately. The correlation among trauma history (total number of traumatic events), trauma severity (injury and life threat of most traumatic event), attributions, and posttraumatic stress was explored to assess the need to include trauma history and severity as control variables.

Path coefficients for each direct path within the specified model were estimated using regression analyses. Three contrast coded vectors were created to code group membership for the independent variable (i.e., type of traumatic event), as well as to test hypotheses regarding differences between groups. Four regression analyses were conducted to estimate path coefficients for the first model: a) regressing the locus attributional dimension on type of traumatic event (three vectors) and control variables, b) regressing the stability dimension on type of traumatic event and control variables, c) regressing the globality dimension on type of traumatic event and control variables, and d) regressing PTSD symptoms on type of event,

control variables, and the three attributional dimensions. For the last two models, two regression

equations were estimated: a) regressing the composite attributional term on type of traumatic

event and control variables, and b) regressing PTSD symptoms on type of event, attributional

term, and control variables. An indirect pathway would be demonstrated if type of event

significantly predicted an attributional dimension and the same attributional dimension

significantly predicted PTSD symptoms. The magnitude of the indirect pathway was obtained by

multiplying the path coefficients for the two direct pathways.

While the path model specified whether events generally differed in relation to each

attributional dimension and posttraumatic stress, it did not address additional hypotheses

regarding specific differences between groups on these outcomes. Therefore, four planned

comparisons tested hypothesized differences between groups on PTSD symptoms: a) comparison

of adult interpersonal violence to natural disasters, b) comparison of adult interpersonal violence

to accidents, c) comparison of child abuse to natural disasters, and d) comparison of child abuse

to accidents. Exploratory analyses compared natural disasters to accidents and interpersonal

violence to child abuse. A similar set of analyses was performed to test differences between

groups for each attributional dimension (locus, stability, and globality) and each composite

measure (internal/stable/global and internal/unstable/specific). These comparisons were

conducted using Tukey's honestly significant difference test to correct for familywise error.

Model 2: Moderating Effects of Event Type

This model tested whether the type of traumatic event served as a moderator of the

relationship between attributions and posttraumatic stress. Because there were no differences in

group means between child abuse and adult interpersonal violence (see Table 4), and to increase

the power of the tests for moderating effects, these two groups were combined into a larger

group representing child and adult interpersonal violence. This combined group was used in all tests of moderating effects. Therefore, only two vector terms were used to code for event type.

Since the hypotheses were testing the effect of the composite internal, unstable, specific attributions construct, the composite attributions term was used in the first set of analyses. The attributions term was centered for the purpose of these analyses, which allows for more meaningful interpretation of the regression coefficients (see Aiken & West, 1991). Interaction terms were created to represent the interaction between traumatic group membership and attributions. In this case, two vectors were necessary to represent trauma group membership; therefore, two interaction terms were used in the analyses. Separate analyses were conducted with different sets of interaction terms in order to examine all contrasts between trauma groups (i.e., contrast between accident and IPV* attributions, contrast between accident and disaster*attributions, and contrast between natural disaster and accident*attributions). To test the significance of the interaction, posttraumatic stress was regressed on attributions, trauma group membership (two vector terms), and the interaction between attributions and trauma group (two terms). An overall significant interaction was evaluated by the significance of R^2 change when the two interaction terms were added to the model. For significant interaction terms, the simple slopes were tested for significant relationships between attributions and posttraumatic stress for each trauma group.

Further exploratory analyses were performed to examine whether trauma group membership moderated the relationship between the three separate attributional dimensions (locus, stability, globality) and PTSD symptoms. To perform these analyses, the categorical moderator (traumatic events) was again represented by two contrast coded vectors. Each of the three attributions terms were centered. Interaction terms were created to represent the interaction

between traumatic group membership and attributions. Because two vectors represented trauma group membership, two interaction terms were created for each attributions term. To test the significance of each interaction term, posttraumatic stress was regressed on attribution (locus, stability, or globality), trauma group membership (two vector terms), and the interaction between attributions and trauma group (two terms). This model was applied for each of the three attributions terms. Similar to previous analyses, the simple slopes were tested for significant relationships between attributions and PTSD symptoms for each trauma group.

CHAPTER 4

RESULTS

Participants were selected from a larger sample based on having endorsed one of four events as the most traumatic of those that they had experienced: serious accident, natural disaster, child abuse, or adult interpersonal violence. A total of 424 participants (31%) were thus selected from the original sample of 1372 individuals. Of the study sample, 161 identified a serious accident as most traumatic, 103 identified natural disaster, 75 identified child abuse, and 85 identified adult interpersonal violence. The mean age of the study sample was 18.9 ($SD =$ 1.4); 97% were single; 80% identified as Caucasian, 7% identified as African American, and 7% identified as Asian. The majority (81%) of participants could be classified as middle- to upper-middle class (parents employed as executives, managers, or other skilled professionals). The mean number of different traumatic events endorsed on the TEQ was 2.0 ($SD = 1.4$). The mean severity level for the most traumatic event was 4.8 ($SD = 3.2$). Mean responses on study measures are depicted in Table 2 and correlation among study measures is depicted in Table 3.

Model 1: Mediating Role of Attributions

Model 1 employed path analysis to test the mediating effects of attributions in the relationship between traumatic event type and posttraumatic stress symptoms. Because number of traumatic events was significantly correlated with event type, internal attributions, global attributions, and PTSD symptoms (see Table 3), this construct was added as a control variable in the path model. Event severity was correlated with event type and PTSD symptoms and was also included as a control variable in the model.

Table 2

Means and Standard Deviations for Study Measures

Measure	Mean	Standard Deviation
Internal Attributions	2.65	2.08
Stable Attributions	3.87	2.26
Global Attributions	2.35	1.80
Internal, Stable, Global Composite*	0.02	1.80
Internal, Unstable, Specific Composite*	-0.00	1.78
Posttraumatic Stress	28.96	12.75

*Composite measures were based on sums of normalized scores for each attributional dimension.

Table 3
Correlations among Study Variables

	1	2	3	4	5	6	7	8	9	10	11
1. Accident[a]	---										
2. Natural disaster[a]	---	---									
3. Adult IPV[a]	---	---	---								
4. Child abuse[a]	---	---	---	---							
5. Internal attributions	**.13**** ($n = 407$)	**-.39***** ($n = 407$)	**.19**** ($n = 407$)	**.06** ($n = 407$)	---						
6. Stable attributions	**-.05** ($n = 395$)	**.28***** ($n = 395$)	**-.12*** ($n = 395$)	**-.12*** ($n = 395$)	**-.25***** ($n = 395$)	---					
7. Global attributions	**-.12*** ($n = 406$)	**-.29***** ($n = 406$)	**.29***** ($n = 406$)	**.17**** ($n = 406$)	**.27***** ($n = 405$)	**.09** ($n = 395$)	---				
8. Internal, stable, global (composite)	**-.03** ($n = 395$)	**-.21***** ($n = 395$)	**.20***** ($n = 395$)	**.06** ($n = 395$)	**.21** ($n = 395$)	**.49***** ($n = 395$)	**.45***** ($n = 395$)	---			
9. Internal, unstable, specific (composite)	**.17**** ($n = 394$)	**-.22***** ($n = 394$)	**.01** ($n = 394$)	**.01** ($n = 394$)	**.35***** ($n = 394$)	**-.69***** ($n = 394$)	**-.27***** ($n = 394$)	**-.37***** ($n = 394$)	---		
10. PTSD Symptoms	**-.14**** ($n = 419$)	**-.33***** ($n = 419$)	**.28***** ($n = 419$)	**.26***** ($n = 419$)	**.14**** ($n = 403$)	**-.04** ($n = 391$)	**.34***** ($n = 402$)	**.24***** ($n = 391$)	**-.10** ($n = 390$)	---	
11. Event severity	**.24***** ($n = 406$)	**-.22**** ($n = 406$)	**.00** ($n = 406$)	**-.05** ($n = 406$)	**.09** ($n = 393$)	**.02** ($n = 382$)	**.04** ($n = 393$)	**.08** ($n = 382$)	**.01** ($n = 381$)	**.23**** ($n = 401$)	---
12. Number of different traumatic events	**-.24***** ($n = 424$)	**-.11*** ($n = 424$)	**.18***** ($n = 424$)	**.22***** ($n = 424$)	**.10*** ($n = 407$)	**-.01** ($n = 395$)	**.21***** ($n = 406$)	**.17**** ($n = 395$)	**-.05** ($n = 394$)	**.43***** ($n = 419$)	**.25***** ($n = 406$)

[a]Traumatic events were coded "1" if identified as the most traumatic event experienced and "0" if another event was identified as most traumatic.
*p < .05   ** p < .01 ***p < .001

Results from the first path analysis (in which the three attributional dimensions were included as separate variables) indicated that type of event was related to each attributional dimension, with standardized regression coefficients indicating similar effect sizes for each relationship (see Figure 3). Only the global attributional dimension was significant in predicting posttraumatic stress, when evaluated in the context of the other two attributional dimensions. The magnitude of the indirect pathway from event type to PTSD symptoms through global attributions was .06. Type of event, number of traumatic events, and event severity all exerted significant direct effects on PTSD symptoms. The entire model accounted for a significant proportion of variability in PTSD symptoms, $R^2_{adj} = .33$, $F(8, 369) = 24.52$, $p < .001$.

Path models investigating the relationships among event type, composite attributional measures, and PTSD symptoms are represented in Figures 4 and 5. Both models accounted for a significant proportion of variance in PTSD symptoms (internal, stable, global composite: $R^2_{adj} = .32$, $F(6, 371) = 31.11$, $p < .001$; internal, unstable, specific composite: $R^2_{adj} = .33$, $F(6, 370) = 31.85$, $p < .001$). Type of event was related to both composite attributional measures. The internal, stable, global composite exhibited a significant positive relationship with posttraumatic stress and the internal, unstable, specific composite exhibited a significant negative relationship with posttraumatic stress. The magnitude of the indirect effect from event type to posttraumatic stress through attributions was .02 for the internal, stable, global composite and -.03 for the internal, unstable, specific composite. Path coefficients relating composite attributions to event type and posttraumatic stress were not as large as coefficients relating separate attributional dimensions to event type and posttraumatic stress (as depicted in the first model).
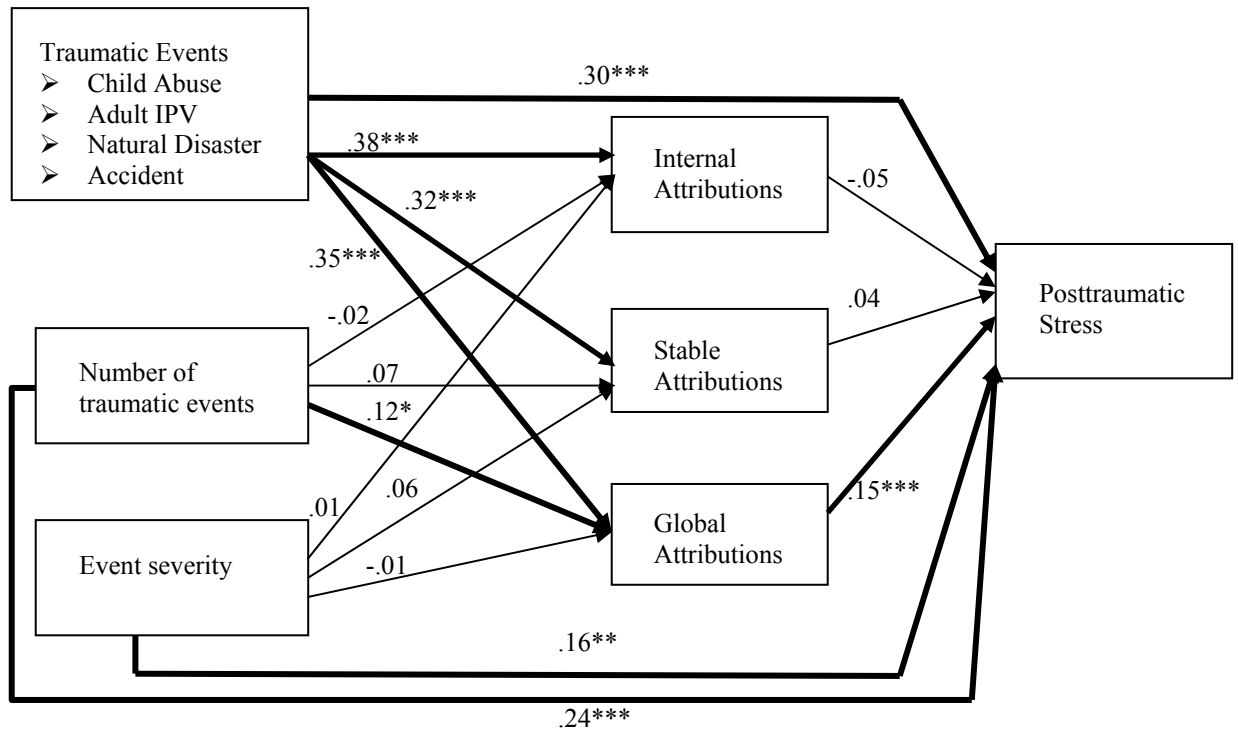
Figure 3. Path diagram for the mediational model examining the role of separate attributional

dimensions in the relationship between event type and posttraumatic stress, controlling for

number of traumatic events and event severity. Path coefficients are based on standardized

regression coefficients. $N = 377$.

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

Figure 4. Path diagram for the mediational model examining the role of the internal, stable,

global composite attributional term in the relationship between event type and posttraumatic

stress, controlling for number of traumatic events and event severity. Path coefficients are based

on standardized regression coefficients. *N* = 376.

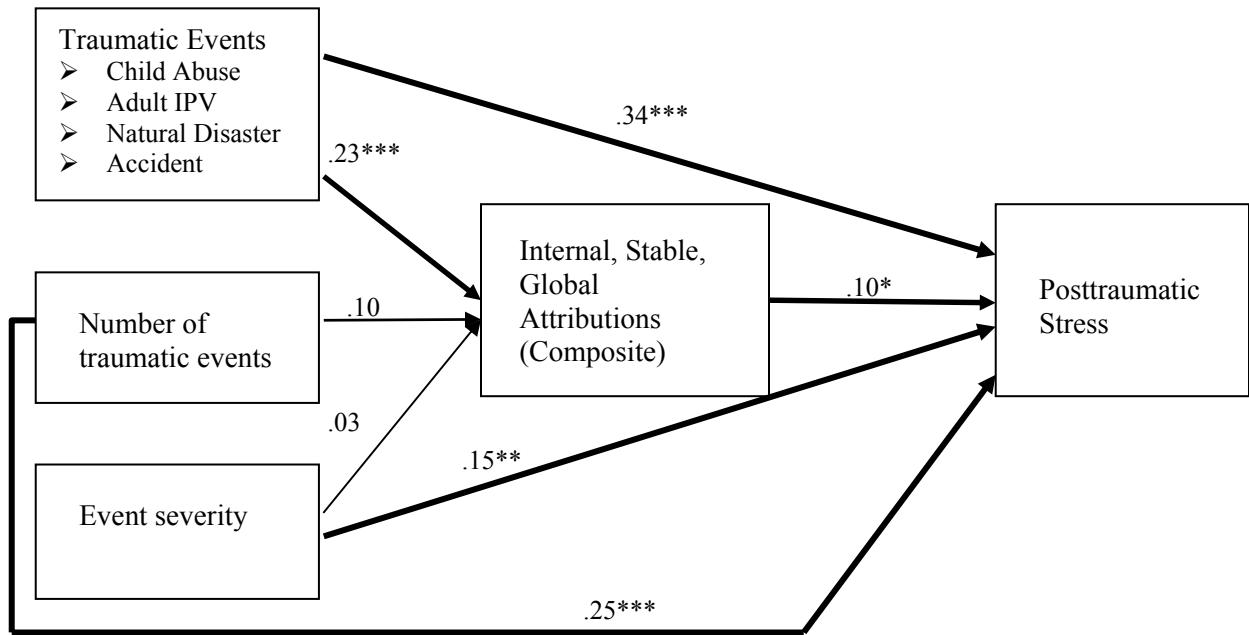**p < .05, **p < .01, ***p < .001*
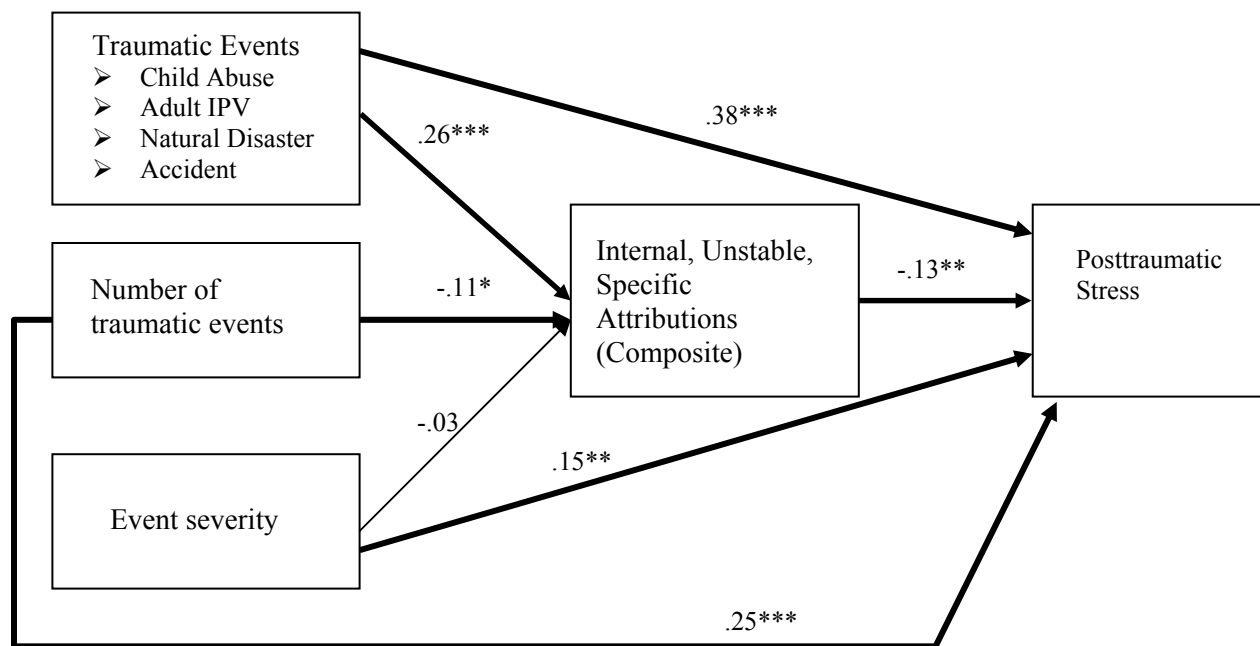
Figure 5. Path diagram for the mediational model examining the role of the internal, unstable, specific composite attributional term in the relationship between event type and posttraumatic stress, controlling for number of traumatic events and event severity. Path coefficients are based on standardized regression coefficients. *N* = 377.

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

To aid in interpretation of path coefficients and to test hypotheses regarding differences between survivors of the four event types, group mean differences on attributions and PTSD symptoms were examined. Tukey's HSD indicated that natural disaster survivors endorsed significantly greater external, stable, and specific attributions in comparison to the other three groups. Child abuse and adult interpersonal violence survivors reported higher levels of global

attributions than accident and natural disaster survivors. Accident survivors also reported higher

levels of global attributions in comparison to natural disaster survivors. Differences between

groups on the composite internal, stable, global attributional measure exhibited a similar pattern,

with child abuse and interpersonal violence survivors endorsing the highest levels. Natural

disaster survivors represented the lowest end of the continuum on the composite internal,

unstable, specific measure. Finally, child abuse and adult interpersonal violence survivors

reported more posttraumatic stress symptoms than the other two groups. Natural disaster

survivors reported significantly fewer posttraumatic stress symptoms in comparison to all three

groups (see Table 4).

Table 4

Group Means on Attributional Dimensions and Posttraumatic Stress

Dependent variable	Adult interpersonal violence	Child abuse	Accident	Natural disaster
Internal attributions	3.43$_a$	2.91 $_a$	2.99 $_a$	1.19 $_b$
Stable attributions	3.34 $_a$	3.26 $_a$	3.72 $_a$	5.03 $_b$
Global attributions	3.37 $_a$	3.00 $_a$	2.08$_b$	1.43$_c$
Internal, stable, global attributions	0.71 $_a$	0.27 $_{ab}$	-0.05 $_b$	-0.69 $_c$
Internal, unstable, specific attributions	0.03 $_a$	0.04 $_a$	0.37 $_a$	-0.72 $_b$
Posttraumatic Stress	36.05 $_a$	36.19 $_a$	26.69 $_b$	21.61 $_c$

Note. Means in the same row that do not share subscripts differ at *p* < .05 in the Tukey honestly
significant difference comparison. Composite measures were based on sums of normalized
scores for each attributional dimension.

Model 2: Moderating Effects of Event Type

Model 2 tested the moderating effects of event type on the relationship between attributions and posttraumatic stress symptoms. For the purpose of these analyses, child abuse and adult interpersonal violence groups were combined into one group representing survivors of interpersonal violence throughout the lifespan. The first set of analyses revealed a significant interaction between the composite internal, unstable, specific attributions term and event type in predicting PTSD symptoms (see Table 5). Trauma history and severity were not included as control variables in the reported findings, as they were not correlated with the composite attributional term. Furthermore, their inclusion in the model did not alter the results.

The relationship between attributions and PTSD symptoms for each event type was plotted for one standard deviation above and below the mean of internal, unstable, specific attributions (see Figure 6). An evaluation of the simple slopes indicated that only the slope for the interpersonal violence group was significantly different from zero at $p < .05$ ($t = -3.36$). Therefore, for interpersonal violence survivors that made more internal, unstable, and specific attributions, PTSD symptoms decreased. In contrast, results did not support a significant relationship between this attributional style and PTSD symptoms for accident and natural disaster survivors. An investigation of vectors representing contrasts between groups revealed that two contrasts were significant: a) natural disasters versus interpersonal violence and b) accidents versus interpersonal violence. In other words, the slopes relating attributions to PTSD symptoms differed significantly between interpersonal violence and the other two groups.

Table 5

Test of the Interaction between Internal/Unstable/Specific Attributions and Event Type in

Predicting Posttraumatic Stress

Variables Included in the Model	R^2_{adj}	ΔR^2
Step 1	.21***	
1. Internal/Unstable/Specific Composite		
2. Event type		
Step 2	.22***	.02**
1. Internal/Unstable/Specific Composite		
2. Event type		
3. Event*Attribution		

Note. $N = 389$

**$p < .01$, ***$p < .001$
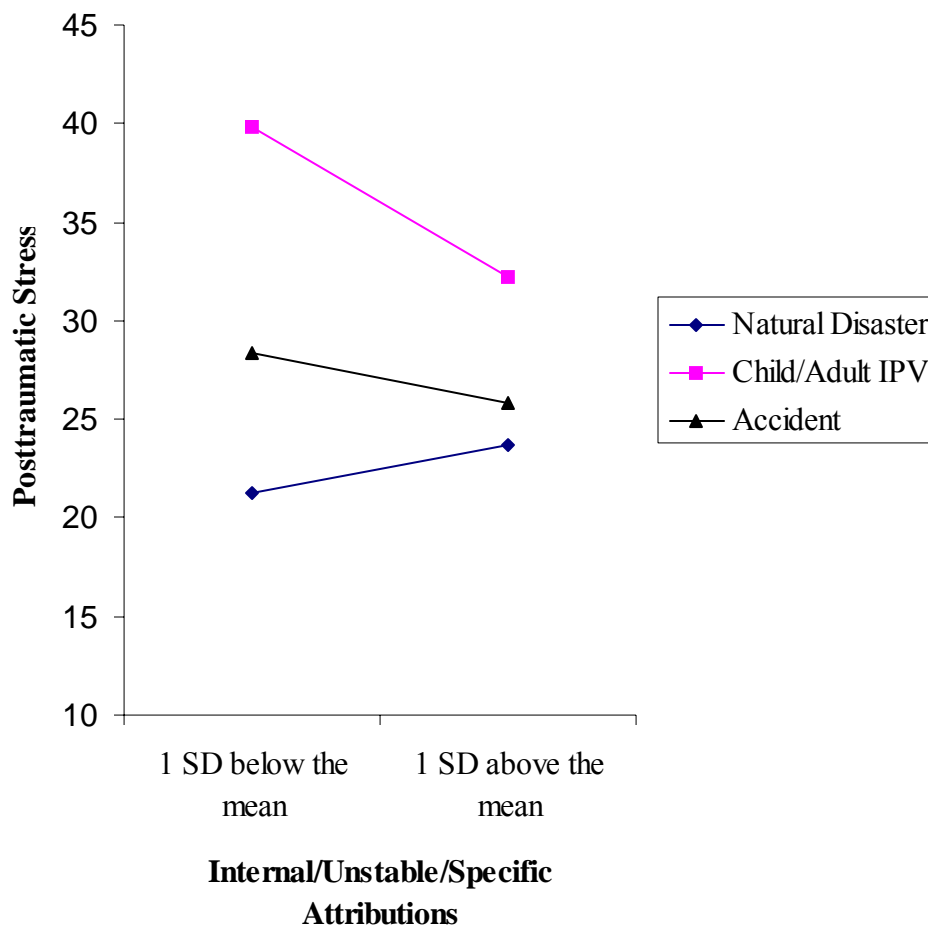
Figure 6. Interaction effects for internal/unstable/specific attributions by event type in predicting posttraumatic stress

The second set of analyses assessed the interaction between each attributional dimension and event type in predicting PTSD symptoms. Because number of traumatic events but not event severity was correlated with individual attributional dimensions, only the number of traumatic events was entered as a control variable in the analyses. Regression analyses demonstrated significant interaction effects for only one variable: stability by event type (see Tables 6-8). The relationship between stability attributions and PTSD symptoms for each event type was plotted for one standard deviation above and below the mean of the stability dimension (see Figure 7).

An evaluation of the simple slopes indicated that the slopes for the natural disaster group and interpersonal violence group were significantly different from zero at $p < .05$, while controlling for number of traumatic events ($t = -2.52$, $t = 3.60$, respectively). Specifically, for natural disaster survivors, PTSD symptoms decreased as attributions to stable causes increased. In contrast, more stable attributions were associated with increased PTSD symptoms among interpersonal violence survivors. When contrast coded vectors were evaluated to determine significant differences between groups within this model, the following two contrasts were significant: a) natural disasters versus interpersonal violence and b) accidents versus natural disasters. In other words, the relationship between stable attributions and posttraumatic stress was significantly different for natural disaster survivors in comparison to the other two groups.

Post hoc analyses were conducted to explore factors that might account for differences between groups on the relationship between stability attributions and posttraumatic stress. While the total number of traumatic events was entered as a control variable in the study analyses, event severity was not included because it was not related to attributions across all trauma groups. However, exploratory analyses revealed that event severity *was* correlated with stability within the interpersonal violence group alone ($r = .25$, $p < .05$). These findings suggested that event severity might explain why interpersonal violence survivors in particular demonstrated increased symptoms as stability attributions increased. Therefore, further analyses were conducted to evaluate the interaction term when severity was included in the model. Results demonstrated that the overall interaction between stability and event type no longer attained significance ($\Delta R^2 = .01$, $p = .06$). However, the vector contrasting natural disaster to interpersonal violence remained significant at $p < .05$. In sum, a similar pattern of relationships

remained when controlling for severity, although the significance of these relationships was

attenuated.

Table 6

Test of the Interaction between Internal Attributions and Event Type in Predicting Posttraumatic

Stress

Variables Included in the Model	R^2_{adj}	ΔR^2
Step 1	.28***	
1. Total number of events		
2. Internal		
3. Event type		
Step 2	.28***	.00
1. Total number of events		
2. Internal		
3. Event type		
4. Event*Attribution		

Note. N = 402

***$p < .001$

Table 7

Test of the Interaction between Stable Attributions and Event Type in Predicting Posttraumatic

Stress

Variables Included in the Model	R^2_{adj}	ΔR^2
Step 1	.27***	
1. Total number of events		
2. Stable attributions		
3. Event type		
Step 2	.29***	.02**
1. Total number of events		
2. Stable attributions		
3. Event type		
4. Event*Attribution		

Note. N = 390

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

Table 8

Test of the Interaction between Global Attributions and Event Type in Predicting Posttraumatic

Stress

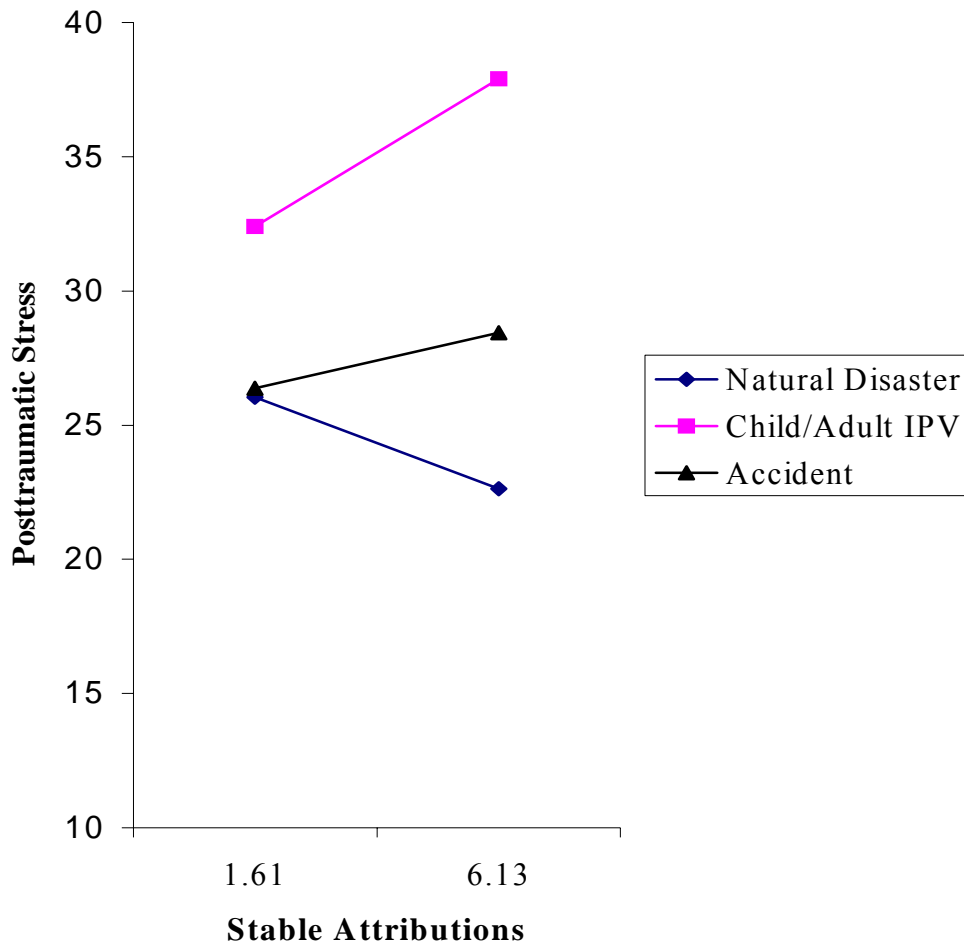| Variables Included in the Model	R^2_{adj}	ΔR^2
Step 1	.30***	
1. Total number of events		
2. Global attributions		
3. Event type		
Step 2	.30***	.00
1. Total number of events		
2. Global attributions		
3. Event type		
4. Event*Attribution		

Note. N = 401

****p* < .001

Figure 7. Interaction effects for stable attributions by event type in predicting posttraumatic

stress, controlling for total number of events. Values for stable attributions represent one

standard deviation below and one standard deviation above the mean.

CHAPTER 5

DISCUSSION

The purpose of this study was to examine the role of attributions in the development of PTSD symptoms among women after exposure to different types of traumatic events. Partial support was found for two proposed models. The first model conceptualized attributions as serving a mediating role in the relationship between event type and posttraumatic stress. The second model was concerned with the moderating effects of event type on the relationship between attributions and posttraumatic stress.

Model 1: Mediating Role of Attributions

The first set of analyses addressed the following question: Do events differ in their likelihood of eliciting particular types of attributions that, in turn, account for variability in PTSD symptoms? Partial support was found for study hypotheses. Path models demonstrated significant indirect effects for individual and composite attributional terms in relating event type to PTSD symptoms, above and beyond the influence of event severity and trauma history. The magnitude of path coefficients relating attributions to event type and posttraumatic stress were greatest in the model assessing attributions as separate dimensions (Figure 3). Therefore, this first model likely represents the best illustration of the intervening role of attributions. Within this model, an indirect effect was supported only for the pathway from event type through global attributions to PTSD symptoms. Futhermore, the magnitude of the indirect effect was small, and a moderate size direct effect remained for the relationship between event type and PTSD symptoms. This suggests that the nature of the traumatic event continues to play an important

role, regardless of the type of attributions that are made. In addition, other mediating variables, such as social support and coping styles, may exist.

Within the path model, the nature of the relationships among event type, attributions, and posttraumatic stress were further explored to evaluate additional study hypotheses. First of all, the expected relationship between event type and posttraumatic stress symptoms was confirmed. Consistent with hypotheses, child abuse and interpersonal violence were associated with the highest rates of PTSD symptoms. Natural disaster survivors reported significantly lower levels of PTSD symptoms in comparison to child abuse, interpersonal violence, and accident survivor groups. These findings are congruent with prior literature reporting the relative risk for PTSD for different index events (e.g., Breslau et al., 1998). Although the higher rates of PTSD among interpersonal violence survivors are often attributed to the severity of the event, the effects of event type on PTSD symptoms within this study were of moderate size even when controlling for severity. It is possible that the effects of event type on posttraumatic stress could be accounted for by other factors that were not assessed in the current study (e.g., recurrent nature of the index event, social context).

Second, the hypothesis that attributions would differ for different events was also supported. As expected, attributions for natural disasters were more external in comparison to attributions made for other traumatic events. Contrary to expectations, adult interpersonal violence and child abuse survivors did not engage in more self-blame than accident survivors. These findings are interesting, considering the much lower rates of self-blame reported among motor vehicle accident survivors in comparison to interpersonal violence survivors in prior studies. However, the one study that reported frequency of attributions among motor vehicle accident survivors measured attributions in terms of whether victims attributed *reponsibility* for

the event to themselves versus others (Hickling et al., 1999). Attributions of responsibility may differ from attributions of the cause to internal versus external factors. Furthermore, results from the current study may differ from prior studies based on the fact that, in this study, internal and external attributions were measured as two ends of one continuum. In contrast, a number of other studies have assessed internal and external attributions as separate items or dimensions. The current measurement system may have obscured differences between groups on external and internal attributions. In general, the mean was weighted towards external blame for all events, which was consistent with previous literature.

Regarding the stability dimension, natural disaster survivors differed from all other groups in terms of their tendency to make more stable attributions. In other words, natural disaster survivors indicated higher levels of agreement with the notion that the same cause would be present again, should the event recur. When asked to describe the cause of the event on the Attributional Style Questionnaire, typical responses for natural disaster survivors were "weather" or "nature." Therefore, it is not surprising that they would expect this cause to be responsible for future occurrences of natural disasters. For all other groups, the mean response on the stability dimension corresponded with the middle range (halfway between unstable and stable).

In relation to the globality dimension, hypotheses that child and adult interpersonal violence survivors would make more global attributions were supported. In addition, accident survivors made more global attributions than natural disaster survivors (i.e., indicated that the cause of the event influenced other areas of their lives). This may be due to the fact that interpersonal causes for events are more likely to be identified as responsible for interpersonal violence and accidents in comparison to natural disasters. Interpersonal causes are more likely to remain present to affect other areas of a person's life, as opposed to fleeting environmental

causes that participants frequently identified as responsible for a natural disaster. Since global attributions represented the only significant indirect pathway in the path model, differences between groups on this dimension appear to partially account for different levels of posttraumatic stress across groups. In particular, the tendency for interpersonal violence survivors to perceive the cause of these negative events as affecting other areas of their lives leads to heightened symptoms of PTSD in comparison to participants who experienced other types of trauma.

Differences between groups were also found in relation to the two composite attributional terms. Interpersonal violence survivors reported the highest levels of internal, stable, global attributions and natural disaster survivors reported the lowest levels of internal, unstable, specific attributions. The relationships between event type and composite attributional measures were similar in direction and smaller in magnitude, as compared to the relationships between event type and individual attributional measures. Therefore, variability accounted for by the composite measures can likely be attributed to the effects of individual attributional dimensions. For example, interpersonal violence survivors endorsed more global and more internal attributions, which was likely responsible for this group's higher scores on the internal, stable, global composite.

As previously stated, only global attributions were significantly related to PTSD symptoms in the first path model. Based on the results from this study, it appears that attributing a traumatic event to a global cause is the most influential attribution in determining posttraumatic stress symptoms. Furthermore, this attributional dimension is likely driving the significant relationships between composite attributional terms and PTSD symptoms in the additional models. This conclusion is further supported by the fact that the magnitude of the relationships

between composite attributional terms and PTSD symptoms was smaller than the singular effect of global attributions on PTSD symptoms.

The fact that global attributions relate to posttraumatic stress is consistent with certain aspects of information-processing models of PTSD. First of all, global attributions for traumatic events may be related to the process of overaccommodation (altering pre-existing beliefs to an extreme degree), which is proposed to account for increased symptoms among trauma survivors (Resick & Schnicke, 1992). For example, survivors who attribute a traumatic event to global causes may develop beliefs such as "bad things are always happening to me; the cause of this event is negatively affecting all areas of my life." The development of these schemas may result in a representation of the world as a pervasively threatening place and to the formation of a large fear network, which is expected to account for symptoms of PTSD (e.g., Chemtob et al., 1988; Foa et al., 1989).

The hypothesized relationships between internality, stability, and posttraumatic stress within the path model were not supported. This is inconsistent with prior literature, particularly regarding the well-documented relationship between self-blame and increased posttraumatic symptoms (see Table 1). However, there are at least two studies that found the global dimension to be the only attributional dimension of the three dimensions of interest to be related to PTSD (Gray & Lombardo, 2004; Wenninger & Ehlers, 1998). The discrepancy between the current findings and research connecting internality and stability dimensions to PTSD may be due to the fact that the majority of prior studies did not evaluate the effects of attributional dimensions simultaneously. When they did investigate dimensions other than internality, they either reported separate correlation coefficients for each attributional dimension or combined the attributional dimensions into a composite measure. They also tended to focus on dispositional attributional

style as opposed to event-specific attributions. Therefore, methodological differences between the current study and prior research may account for the differing results. Another explanation for the inability to detect the main effects of internal or stable attributions on PTSD symptoms involves the presence of potential moderating effects, which were examined in Model 2.

Results from the current study did confirm a significant correlation between internal attributions and PTSD symptoms before inclusion in the model. This finding is analogous to prior findings derived from analyzing attributional dimensions in terms of separate correlation coefficients. However, within the current study, the relationship between internal attributions and posttraumatic stress was no longer significant when evaluated within the context of the other attributional dimensions. This is possibly due to the overlap between internal and global attributions, which were moderately correlated in this study (see Table 3). This could be interpreted to mean that victims who blame themselves for a negative event (internal attribution), are likely to perceive this cause as more pervasive than a transient external factor. Therefore, participants reporting internal attributions may also endorse higher levels on the global dimension, wherein they state that the cause affects other areas of their lives. It may be that the harmful effects of internal attributions are accounted for by their global nature.

In sum, a significant indirect effect was found for the effects of event type on posttraumatic stress through global attributions. An exploration of these effects indicated that survivors of adult interpersonal violence and child abuse exhibited greater global attributions and symptoms of PTSD, in comparison to natural disaster and accident survivors. While the tendency for interpersonal violence survivors to make global attributions accounted for part of the variance in posttraumatic symptoms, event type, severity, and number of traumatic events continued to play an important role. Although event type was related to the tendency to make internal and

stable attributions, these attributions did not play a significant role in predicting PTSD

symptoms.

<center>Model 2: Moderating Effects of Event Type</center>

The moderating effects of event type on the relationships between attributions and

posttraumatic stress were explored in Model 2. This model addressed the second research

question posed by the current study: Do attributions have a different impact, depending on the

event? Hypotheses regarding the anticipated differential effects of the internal, unstable, specific

composite and the internal attributional dimension on posttraumatic stress were evaluated.

Analyses involving the stability and globality dimensions were considered exploratory.

Significant moderating effects were found for composite internal, unstable, specific attributions,

and for the stability dimension alone.

Differences between groups in the relationship between the composite attributional term

and posttraumatic stress were contrary to hypothesized differences. It was expected that internal,

unstable, specific attributions would have a maladaptive effect for interpersonal violence

survivors and an adaptive effect for accident survivors. In fact, results suggested that this

attributional pattern resulted in fewer symptoms of PTSD for interpersonal violence survivors

and did not significantly affect symptoms for accident and natural disaster survivors.

The most parsimonious explanations for the significant moderating effects are derived

from interpreting the stability dimension alone. It appears that differences between groups on the

stability dimension accounted for the observed relationships between the composite term and

PTSD symptoms. This conclusion is based on an analysis of the moderating effects for stability,

which revealed similar magnitudes and directions of relationships between attributions and

PTSD symptoms across trauma groups. In this case, more stable attributions were associated

<center>62</center>

with increased PTSD symptoms for interpersonal violence survivors and decreased PTSD symptoms for natural disaster survivors. The relationship between stable attributions and PTSD symptoms was not significant for accident survivors.

Further support for the utility of interpreting the stability dimension alone (as opposed to referring to the internal, unstable, specific composite) is garnered from observations of the slopes relating attributions to posttraumatic stress, which were greatest in magnitude within the stability attributions model. Moreover, referring solely to the stability dimension helps explain why results for the composite attributional term were opposite of expectations. It appears that the explanatory power offered by the stability dimension overrides any effects of a composite attributional pattern.

Post hoc analyses included both number of traumatic events and event severity as control variables that might explain some of the differential effects of stability attributions on PTSD symptoms across traumatic events. The overall interaction between event type and stability attributions was no longer significant in these analyses. These results could be interpreted in multiple ways. First of all, trauma characteristics account for a considerable amount of variance in posttraumatic stress symptoms, leaving less variance to explain through the event type by stability interaction. Second, event severity was positively correlated with the stability dimension among interpersonal violence survivors; thus, stability could have been serving as a proxy for event severity, thereby accounting for the positive relationship between stability and posttraumatic stress among interpersonal violence survivors. Similarly, stability and severity could be conceptually intertwined for interpersonal violence survivors. Interpersonal violence that is inflicted repeatedly by the same perpetrator, and therefore likely to elicit stable attributions, is probably more severe in nature. Both stability and severity may thus be important

in predicting posttraumatic stress among interpersonal violence survivors. In fact, controlling for event severity only slightly altered the observed effect of event type on the relationship between stability and posttraumatic stress (similar differences between groups remained). This suggests that the stability by event type interaction merits further attention.

The differences between groups regarding the relationship between stable attributions and posttraumatic stress may be related to the different meanings offered by stable attributions in the context of different events. For example, a stable attribution for interpersonal violence may reflect the development of negative schemas about the self or the world, such as "I am always to blame for negative events" or "terrible people will always be trying to hurt me." This process can be situated within theories of PTSD that relate perceived uncontrollability and incompetence to PTSD (Foa et al., 1989; Foa & Rothbaum, 1998). In contrast, stable attributions for natural disasters could result in protective cognitions about the predictability and controllability of the world such as "there is an understandable and consistent cause for these events." Such attributions would not have negative implications for beliefs about the self or others, especially considering the fact that the cause is primarily attributed to impersonal factors such as weather patterns. Furthermore, the fact that natural disasters are infrequent events could account for fewer negative implications for making stable attributions. On the other hand, making attributions to *unstable* causes for natural disasters could result in a perception of the world as uncontrollable. In sum, stable attributions for interpersonal violence appeared to exert a maladaptive effect for interpersonal violence survivors, an adaptive effect for natural disaster survivors, and no effect for accident survivors.

Hypotheses regarding a differential relationship between internal attributions and posttraumatic stress across events were not supported. Specifically, it was expected that

increased internal attributions among interpersonal violence survivors would be associated with higher rates of PTSD symptoms among this population, in comparison to natural disaster survivors. Again, the fact that internal and external attributions were measured on one continuum may have limited the ability to detect relationships between internal attributions and other variables.

A moderating effect of event type on the relationship between global attributions and PTSD symptoms was not observed. This is not surprising, given the results from Model 1. These findings suggest that global attributions are related to increased PTSD symptoms across all types of traumatic events assessed within this study. Furthermore, the magnitude of this relationship appears similar across events. Since the analyses of moderating effects were exploratory in nature, additional research is necessary to further compare and contrast the attributional process across different types of traumatic events.

Limitations

There are several methodological limitations of the current study that should be noted. First, the data were obtained through retrospective reporting. It may have been difficult for participants to report accurately on prior traumatic events such as childhood abuse experiences. A related limitation is that potentially distal relationships between variables were examined. For example, the relationships between traumatic experiences that took place several years ago and current PTSD symptoms represent distal relationships that were examined in the study. As a result, multiple intervening variables may have exerted an effect on current attributions and posttraumatic stress, thus reducing the ability to detect relationships among attributions and PTSD symptoms. In addition, the time elapsed since the traumatic incident(s) and the

administration of the survey may differ among participants, thus adding to variability in the potential influence of intervening factors and to the error variance.

Another aspect of this study that limits the ability to determine the true relationships among the constructs of interest is its correlational nature. In studies of traumatic events and other naturally-occurring phenomena, it is not feasible to manipulate predictor variables in a randomly selected sample of individuals. Therefore, causal linkages between variables cannot be established. Furthermore, the influence of confounding variables (e.g., family environment, socioeconomic status) is difficult to anticipate or control. For example, in this study, interpersonal violence may have been confounded with poor social support and repeated revictimization, which have been associated with worse posttraumatic outcomes (Brewin et al., 2000; Koopman et al., 2005; Ullman & Filipas, 2001; Zoellner et al., 1999). In addition, responses on study measures may have been affected by other events than the one identified as most traumatic. It is likely that the model proposed in this study was not fully specified, and that inclusion of other variables may have allowed for a clearer understanding of relationships among the variables of interest.

Further limitations to this study involve the nature of the current sample. Since the sample consists of a convenience population of undergraduate students, the participants are likely more homogeneous than a community population of trauma survivors on the variables of interest. The range of responses on the posttraumatic stress measure was limited and the mean reflected a largely asymptomatic sample. As a result, relationships between variables of interest may been attenuated. In addition, the current sample likely differs from the larger trauma survivor population in several ways, including socioeconomic status, racial/ethnic diversity,

severity of traumatic experiences, and degree of psychological impairment. Therefore, the ability to generalize the results to the larger population of female trauma survivors is limited.

<div align="center">Implications and Future Directions</div>

The current study represents the first known empirical investigation to directly compare the role of attributions across different traumatic events. Another novel aspect of this study is that it examined the unique effects of separate, event-specific attributional dimensions in predicting posttraumatic stress. Results confirmed that trauma survivors tend to make different types of attributions for different events. Furthermore, findings highlighted the importance of global attributions in predicting posttraumatic stress across events, with global attributions and PTSD symptoms being stronger among those who experienced interpersonal violence at some point in their lives. In contrast, stable attributions were harmful only for interpersonal violence survivors and seemed to exert a protective effect for natural disaster survivors. Data from the current study suggest that the effects of global attributions on symptom outcome may be best understood within a mediational model, whereas the effects of stable attributions may be best illustrated within a moderational model. In addition, results support the utility of examining separate attributional dimensions, as opposed to synthesizing the dimensions within composite measures.

These findings have multiple implications for clinical work with traumatized women. First of all, an assessment of the types of attributions that trauma-exposed individuals make may help identify those most at risk for PTSD. Results from this study suggest that such an assessment should focus primarily on global attributions (in addition to an assessment of event severity and number of traumatic events experienced). Furthermore, restructuring global attributions during the course of therapy may be effective in preventing or alleviating

posttraumatic stress symptoms. For interpersonal violence and natural disaster survivors, the efficacy of clinical interventions may also be enhanced by focusing on stable and unstable attributions, respectively. The differences between trauma groups in relation to attributional tendencies and posttraumatic stress symptoms underscore the importance of tailoring interventions based on the types of events experienced.

Treatment-outcome studies are required to establish the effectiveness of interventions that apply attribution retraining techniques. Empirical studies have already demonstrated the effectiveness of techniques that restructure distorted trauma-related beliefs (e.g., Resick & Schnicke, 1992). Further studies are necessary to determine whether a focus on global and stable attributions would enhance the impact of these interventions.

Several additional avenues for future research are suggested by the current study. First of all, these findings should be replicated in community populations that are more representative of the larger population of female trauma survivors. Future studies may also wish to determine whether similar relationships among event type, attributions, and PTSD exist among trauma-exposed men. Other mediating and moderating factors deserve further investigation, including social support, chronic trauma exposure, emotional responses, specific trauma-related cognitions, and coping style. For example, global attributions may be associated with passive coping or emotions such as hopelessness, anger, and fear that could exacerbate symptoms of PTSD. It would also be interesting to determine whether global attributions are related to trauma-related cognitions detailed within information-processing theories, such as beliefs that the world is pervasively threatening.

In addition to exploring the relationships among study variables and other relevant factors within more representative populations, the measurement of attributions could be significantly

improved. First of all, future studies would likely benefit from analyzing internal and external attributions on separate dimensions. It is conceivable that trauma survivors make both types of attributions and that internal and external attributions can be considered conceptually distinct. In addition, the content of attributions could be further analyzed. For instance, future studies could determine if there are differences between one type of external attribution versus another (e.g., blaming another person versus blaming natural causes). While there is at least one study that has divided the internal-external dimension into separate content areas (e.g., family-blame, perpetrator-blame, self-blame; McMillen & Zuravin, 1997), there are no known measures that assess attributional content for multiple dimensions in a way that could be applied to different types of traumatic events. Further refinement of attribution measures would help advance knowledge regarding the relationships among trauma, cognitive factors, and psychological symptomatology.

In sum, the current study suggests that further research in the area of attributions and posttraumatic sequelae is promising. These findings highlight the importance of attending to differences in cognitive processes across different events, as well as evaluating the relative contributions of these processes to psychological outcomes. Research in this area is particularly meaningful, due to the significant social and psychological burden caused by trauma and PTSD.

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