To Attribute or Not to Attribute, That is the Post-Traumatic Question

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Abstract: - A significant number of persons worldwide will experience a traumatic event during their lifetime, be it natural (e.g., tornado, hurricane, earthquake) or man-made (e.g., terrorist attacks, sexual assault). The most common difficulty experienced after a traumatic event is some type of anxiety, with the group of symptoms typically labeled post-traumatic stress symptoms (PTSS) being the most common type. Although there are numerous evidence-based programs and therapies designed to alleviate PTSS, they are primarily delivered months, sometimes years, after the traumatic event, as only a small percentage of those persons exposed to a trauma will go on to develop clinically significant difficulties. Attempts to identify those mostly likely to develop significant difficulties has uncovered several variables that are predictive of distress, including coping skills, depression, and trauma characteristics. The present paper discusses the results of several studies designed to examine the role of disaster-specific attributions in predicting current and future post-traumatic stress symptoms in both school-age children and young adults. Primary findings include very strong predictive power for attributions (between 36-74% of variance in PTSS symptoms depending on amount of time post-disaster), particularly those involving searching for the meaning behind the disaster, and this predictive ability was far above and beyond the types of coping skills employed, subjective exposure, or objective exposure to the disaster. The significance of these findings to potential identification of and intervention with persons after exposure to trauma will also be addressed.

Key-Words: - Attributions, Posttraumatic stress, Disaster, Prediction, PTSD

1 Introduction

Many people will be exposed to a natural disaster at some point during their lifetime, with estimates ranging between 13-30% [1]. A significant portion of those exposed will not respond well and may experience posttraumatic stress disorder (PTSD) symptoms and/or other mental health difficulties, such as depression or substance use [2]. Many factors have been examined as possibly contributing to the development and maintenance of posttraumatic stress disorder. Many factors, including initial exposure to the trauma, attributional style, and coping strategies, have been both proposed as possible determinants and found to be significantly related to long-term distress [3, 4]. Green et al. [5] identified four primary factors that can determine both short- and long-term adaptation: characteristics of the trauma, cognitive processing of the trauma, characteristics of the individual, and characteristics of the environment. A recent meta-analysis [6] of the adult literature identified seven factors that have been extensively studied: prior history of trauma, prior psychological adjustment, family history of mental illness, perceived life threat, perceived social support post-trauma, level of emotion during or immediately after the trauma, dissociative experiences in response to

the trauma. Of these, dissociative experiences (ES = .35) and perceived social support (ES = -.28) were the most robust predictors of distress. However, there is still obviously an important piece of the predictive puzzle missing, given these small to medium effect sizes.

One of the underlying tenants of cognitive-behavior case formulation, which has extensive empirical support in treating PTSD [7, 8], is that one's interpretation of an event, rather than the event itself, drives a person's reaction to situations, both positively and negatively [9]. For traumatic situations in particular, it seems likely that the type of attribution made could heavily drive whether someone is or is not likely to experience psychological distress. An attribution is commonly defined as a reason or explanation for an occurrence [10]. Causal attributions can be characterized as statements acknowledging some factor(s) that contributed to a given event [11].

Although there has been a significant amount of research examining the roles that attribution style plays in diverse areas of life, such as depression [12], only a small amount of work has specifically addressed the role of attributions in trauma. Instead, many of the findings in

other areas of attribution research have been generalized to traumatic situations. The little specific research that exists seems to suggest that attributions can play a significant role in mediating one's reactions to a trauma or disaster [4, 13], but the exact relation of the two is still unclear. The attributions that people have concerning a trauma are important because they may influence aspects of life such as self-perception and peer relationships, while also contributing to level of distress and PTSS [14].

Several studies have suggested a relationship between number of attributions made for a situation and level of distress over a situation [15, 16]. Generally speaking, those people that either make more attributions or are more concerned with attributions tend to be more distressed. Rubonis and Bickman [17] found that blaming an external source for a traumatic event was related to a higher incidence of pathology than self-blame. Bulman and Wortman [18] also found that blaming something other than one's self resulted in worse adjustment. However, attributions to God or chance have not been found to be associated with more distress, which may be indicative of less time spent dwelling upon the trauma [15].

Recent studies have found that those people who demonstrate trauma-specific attributions that are global, stable, and internal more likely to experience PTSD symptoms after a disaster [19, 4], a finding consistent with attribution research in other areas [10]. Clearly, however, more research is needed to gain a thorough understanding of the relationship between attributions and posttraumatic distress.

The current paper will review the results of three recent studies, two with children, one with adults, designed to examine the relationship between attributions and posttraumatic distress. It will conclude with recommendations for future research directions and the implications of this research for the identification of and intervention with persons most likely to experience PTSD after a trauma.

2 Problem Formulation

Given the either conflicting or non-conclusive nature of previous studies examining predictors of post-traumatic stress symptoms, research examining new predictors was needed. With the lack of research examining the role of attributions, they were specifically targeted for assessment across three distinct studies, described below. In addition to attributions, other factors that had previous support for predictive value (e.g., coping skills, trauma exposure, etc.) were also assessed for their relative contribution to distress.

2.1 Study 1

As fully detailed elsewhere [20, 21], Study 1 was designed to assess and follow over time the presence of posttraumatic stress disorder symptoms in children exposed to a devastating tornado, while also examining the roles that re-exposure to environmental cues, exposure to disaster-related media, attributions and coping style, and other factors, such as demographic variables, play in maintaining a child's level of distress. Two school districts in Oklahoma that had experienced devastating tornadoes in October 2001 were approached by the researchers to determine willingness to participate, and gave permission. Children in grades 3-6 (ages 8-12) and their parents were targeted as participants.

After obtaining permission from both the researchers' university and the school districts, packets were sent home to the parents of all children in grades 3-6. These packets contained consent forms for the study, as well as demographic questionnaires and the Tornado Exposure Questionnaire – Parent report (TEQ-P). Those parents who consent for their child to participate completed the forms and returned them to the school. On the first day of data collection, in early November 2002 (13 months post-disaster), those children who had been given consent to participate in the study were informed about the study and asked for their assent to participate. Those that agreed to participate completed the Tornado Exposure Questionnaire – Child report (TEQ-C), the Reaction Index (RI, a 20-item self-report measure of posttraumatic stress symptoms [22]), the Trauma Attribution Checklist (TAC, a 28-item self-report measure that asked questions concerning personal attributions, omen formations, and the meaning coming from the disaster [23]) and Kidcope (a 10-item checklist developed to assess the frequency of use of different types of coping strategies and the relative effectiveness of each [24]). Follow-up data collection at 19 months post-disaster (April 2003) was conducted in a similar fashion, with the only difference being that parents were only required to complete a new consent form and children completed only the RI, TAC, and Kidcope.

2.1 Study 2

In the follow-up to Study 1 (see [20] for full details), very similar methodology was used to examine posttraumatic stress and attributions in children with more recent disaster exposure. Two school districts in central Oklahoma that had been exposed to tornadoes in May or June 2004 were approached and gave consent to

solicit for participants. As in Study 1, children in grades 3-6 and their parents were targeted. The primary difference with this study was the timing of data collection, with assessments at 6 and 12 months post-disaster (as opposed to 13 and 19 months in Study 1).

Again, after obtaining permission from both the researchers' university and the school districts, packets were sent home to the parents of all children in grades 3-6. These packets contained consent forms for the study, as well as demographic questionnaires and the TEQ-P. Those parents who consented for their child to participate completed the forms and returned them to the school. On the first day of data collection, in early November 2004 (6 months post-disaster), those children who had been given consent to participate in the study were informed about the study and asked for their assent to participate. Those that agreed to participate completed the TEQ-C, RI, and TAC. Follow-up data collection at 12 months post-disaster (May 2005) was conducted in a similar fashion, with the only difference being that parents were only required to complete a new consent form and children completed only the RI and TAC.

2.1 Study 3

After examining children in the studies above, the researchers wanted to examine a young adult population to see if similar results would be found. To maximize comparability between samples, the adult version of the Reaction Index, which uses the same range of scores, was used to assess for PTSD symptoms. In addition, as there were no comparable measures designed to assess post-trauma attributions in adults, the TAC was used as the measure of attributions.

After obtaining institutional approval, participants were solicited directly from undergraduate, introductory courses in psychology, sociology, and anthropology. Potential participants were given a web address that took them to an online survey. After obtaining informed consent, participants completed a demographic questionnaire and a Tornado Exposure Questionnaire (TEQ). Those participants who endorsed recent exposure to a tornado (defined as being within five miles of a tornado that touched down within the last five years) then completed the adult version of the Reaction Index [25] and the Trauma Attribution Checklist, modified for use with adults.

3 Problem Solution

For each of the below studies, the primary focus was to examine the relationship of PTSD-related symptoms to the predictor variables of disaster exposure, attributions, and other variables. Results below are focused on this research question and therefore, for a full report of the descriptive statistics for participant exposure, symptoms, and coping strategies, readers are referred to prior publications.

3.1 Study 1 Participants

One hundred two children ages 8-12 enrolled at one of two public elementary schools in rural southwestern Oklahoma towns participated in Study 1. The majority of the sample was Caucasian (90.9%), with a mean age of 10.4 years (SD = 1.23). Children were spread across grades 3-6 (21.8% in 3rd grade, 15.5% in 4th grade, 25.5% in 5th grade, 37.3% in 6th grade). The sample was split evenly across gender (47.3% male, 52.7% female).

3.2 Study 1 Results

To examine the ability of trauma exposure, attributions, and coping strategies to predict posttraumatic stress symptoms, stepwise multiple regression analyses were used. Of all the questions concerning exposure to the disaster, the child's self-report fear was found to be most highly related to PTSD symptoms and was thus used as the "exposure variable." Attributions were defined as the TAC total score, coping was represented by the total Kidcope score, and posttraumatic stress was defined as the total RI score.

At Time 1 (13 months post-disaster), the TAC total score entered on the first step and accounted for a total of 48.7% of the variance in the total RI score (F (1, 82) = 78.92, p < .001). The child's report of how scared he or she was during the tornado entered on the second step and contributed an additional 5.4%, for a total $R^2 = .541$ for the model (F (2, 82) = 49.29, p < .001). The Kidcope total score was not found to significantly contribute to the prediction of posttraumatic distress.

To further examine the use of the TAC to predict total RI scores, the five scales of the TAC and the child's self-reported fear during the tornado were entered into a stepwise multiple regression analysis. The TAC Search for Meaning scale alone accounted for 40.0% of the variance in total RI score. The child's self-reported fear contributed an additional 7.8% to the model on the second step, while the Attribution of Responsibility scale added an additional 7.6% on the third step. The Hypervigilance/ Expectations scale was added on step four for another 1.7%. On the fifth and final step, the Omen Formation scale was added and contributed 1.5%, for a total $R^2 = .586$ for the model (F (5, 82) = 25.94. The TAC scale of Importance of Attributing

Responsibility was not found to significantly contribute more to the prediction of posttraumatic distress.

Next, the TAC score at Time 1, Kidcope score at Time 1, and self-report of fear during the tornado were again entered into a stepwise multiple regression, this time to predict total RI score at Time 2 (19 months post-disaster). As before, the TAC total score entered on the first step, but only accounted for 12.3% of the variance in total RI score (F (1, 57) = 9.10, p = .004). The other variables were excluded from the equation as they did not significantly contribute to predictive value. Based on this, additional analyses examining the TAC scales were conducted. When all five scales were entered, only the Attribution of Responsibility scale was found to be significantly predictive, accounting for 13.4% of the RI variance (F (1, 57) = 10.58, p = .002).

3.3 Study 2 Participants

Ninety-six children ages 8-13 enrolled at two public elementary schools in central Oklahoma towns participated in Study 2. The children were predominately Caucasian (80.2%), with 10.9% identified as American Indian, and had a mean age of 9.85 years (SD = 1.35). Children were split fairly evenly across sex (45.5% male, 54.5% female) and grade (28.3% in 3rd grade, 23.8% in 4th grade, 31.7% in 5th grade, 14.9% in 6th grade).

3.4 Study 2 Results

Stepwise multiple regression analyses were used to examine the relationship between parent reported exposure, child reported exposure and attributions, and degree of posttraumatic distress as measured by the total score on the RI. Analyses were conducted at each assessment period. At Time 1 (6 months post-disaster), the TAC total score entered on the first step and accounted for a total of 36.4% of the variance in the total RI score (F (1, 96) = 50.34, p < .001). Neither parent nor child reported exposure entered the regression analysis. A second analysis examining the five individual scales of the TAC was then conducted. The Attribution of Responsibility scale entered on step 1, accounting for 33.3% of the variance in RI score (F (1, 77) = 39.43, p < .001). The Hypervigilance/Expectations scale entered on the second step, bringing the R^2 for the model to .373 (F (2, 77) = 23.89, p < .001). The three remaining scales did not significantly contribute to the model.

Next, the Time 1 TAC score and exposure scores were used to predict Time 2 (12 months post-disaster) RI scores. As before, the TAC score entered on the first step, accounting for 34.5% of the variance in distress (F

(1, 34) = 18.90, p < .001). No other variables entered into the model. Again, the scales of the TAC were entered into a separate regression analysis. Exactly as at Time 1, the Attribution of Responsibility scale entered on the first step, here accounting for 35.3% of the variance in RI score (F (1, 30) = 17.40, p < .001) and the Hypervigilance/Expectations scale entered on the second step, bringing the R^2 for the model to .431 (F (2, 30) = 12.35, p < .001).

3.5 Study 3 Participants

A sample of 115 undergraduates participated in Study 3. Participants were predominately Caucasian (85%), single (81%), female (69%), and between the ages of 18-23 (83%), with an equal distribution of freshmen, sophomores, juniors, and seniors.

3.6 Study 3 Results

To test the relationship between distress, attributions, and exposure to the tornado, correlational analyses were first run. Positive significant relationships were found between total RI score and TAC total score (r = .548, p < .001), self-report of distress during the tornado (r = .205, p = .029), and self-reported distress since the tornado (r = .348, p < .001). Consequently, stepwise multiple regression analyses, using the three above variables to predict current distress (as measured by total RI score) were performed. The TAC total score entered on the first step and accounted for 37.6% of the variance in current distress (F (1, 110) = 67.27, p < .001), with neither of the other variables found to contribute significantly to the model.

As in the above study, further analyses were undertaken to determine what in the TAC was driving this observed relationship. The five TAC scales were entered into a stepwise multiple regression, with results similar to Studies 1 and 2. The Attribution of Responsibility scale entered on the first step, explaining 28.4% of RI score variance (F (1, 112) = 45.43, p < .001). Omen Formation entered on step two, adding an additional 3.9%, and the Search for Meaning scale entered on step three, bringing the total for the model up to a R^2 = .379 (F (3, 112) = 23.78, p < .001).

4 Conclusion

While numerous factors have been previously associated with an increased risk of developing posttraumatic stress symptoms following a trauma, very few empirical studies have examined the role that one's attributions for the trauma play. The three studies described above all provide compelling evidence to support the notion that attributions, although not sufficient to fully explain

one's reaction to a traumatic event, certainly play a key role. Indeed, in these studies attributions, particularly on whom or with what blame for the event was placed, predicted a significant portion of the variance in self-reported distress in children, at 6 months (36.4%), 12 months (43.1%), 13 months (48.7%), and 19 months (13.4%), and in adults at a variety of times post-disaster (37.6%).

These findings support the theory underlying many aspects of cognitive-behavioral therapy for posttraumatic stress disorder, which focus on not the actual event but instead one's interpretation of the event and implications of that interpretation [26, 27]. The current results would implicate that those who attempt to find someone or something responsible for the disaster and end up blaming themselves have much worse outcomes than those that do not spend time placing blame or who place blame outside of themselves.

Incorporating these results into treatment strategies could help to decrease the chance that a child or adult may develop psychological distress following a traumatic event. By helping people make more adaptive attributions (such as not placing blame for the trauma) soon after the disaster, there may be either fewer people with PTSD symptoms or lower levels of symptoms in those that are distressed. Given that there are already evidence-based, school wide programs designed to be implemented with children following a disaster (such as the classroom-based intervention program [28] and Overshadowing Threat of Terrorism [29]), a module that focuses on attributions specifically could be added and the resulting improvement tested fairly easily. Similarly, treatments for adults exposed to a trauma could also be designed to test this hypothesis.

Aside from interventions, these findings could also be used to identify those children and adults at greatest risk of developing PTSD symptoms in the future. An assessment of attributions during the time post-trauma when a large amount of PTSD symptoms are normative (e.g., in the weeks or few months immediately afterwards) could provide valuable information on who will be likely to show distress six months or a year down the road. This would allow for more effective, targeted intervention with only those persons at high-risk.

In conclusion, we now have compelling evidence that, at least in natural disaster situations, attributions are a very important aspect of children's and adults' reactions to trauma. Future research needs to be conducted examining if similar results are found in response to other traumas (e.g., sexual or physical assault, motor vehicle accidents, terrorist activities), as well as testing

the hypothesis that early adjustment of attributions results in lower distress later.

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