Analysis of children's written responses to Hurricane Andrew

by

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Abstract

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As part of a longitudinal evaluation of children living in Dade County, Florida, during

Hurricane Andrew, the current study examines children's ($n = 334$) written

perceptions of the worst aspects of the storm. Data were collected on the children's

psychological adjustment three times within a year following the hurricane. Repeated

measures general linear model (GLM) analyses were used to identify predictors of

narrative elaborateness, narrative coherence, first-person pronouns, and internal states

language in children's responses. Demographic variables, traumatic exposure, and

coping were differentially related to these narrative characteristics. Additional

repeated measures GLM analyses were used to examine whether these characteristics

predicted psychological adjustment. Results indicated that children who frequently

used internal states language in their descriptions had more symptoms of

posttraumatic stress disorder (PTSD) and anxiety. Furthermore, children with more

elaborate narratives had higher levels of PTSD symptoms, but only at the initial data

collection period after the hurricane.

Acknowledgements

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Dedication

To my mother and the children of Andrew and Katrina

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Analysis of Children's Written Responses to Hurricane Andrew

Natural disasters and other traumatic events influence children's mental health

in a variety of ways (Vernberg & Varela, 2001). The concept of multifinality, which

refers to the diversity of outcomes in children exposed to similar levels of risk and

adversity (Cicchetti & Rogosch, 1996), is consistent with research on children's

reactions to natural disasters. Children exposed to hurricanes can develop a variety of

reactions, including posttraumatic stress symptoms (PTSS; Russoniello et al., 2002;

Swenson et al., 1996; Vernberg, La Greca, Silverman, & Prinstein, 1996), anxiety (La

Greca, Silverman, & Wasserstein, 1998; Lonigan, Shannon, Taylor, Finch, & Sallee,

1994), depression (Shaw, Applegate, & Schorr, 1996), or no symptoms of

psychopathology at all. Some aspects of disasters influencing this diversity of effects

have been identified. For example, life-threatening experiences during hurricanes, and

the disruptions in daily living that follow a disaster, have been shown to predict the

severity and persistence of PTSS in children (La Greca et al., 1996; Vernberg et al.,

1996). Children who have high levels of social support, few intervening life events,

and use a low number of negative coping strategies have better postdisaster recovery

(La Greca et al., 1996). Conversely, children whose parents are highly distressed

during the postdisaster recovery period exhibit poorer psychosocial adjustment

(Swenson et al., 1996).

The meaning children give to a traumatic event, as determined by their

appraisals, beliefs, and attributions of traumatic circumstances, has also been shown

to have a role in the development of traumatic stress-related symptoms (Fletcher,

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2003). The assigning of meaning to these experiences may be influenced by the way

traumatic events are recalled and shared (Foa, Molnar, & Cashman, 1995; Nelson,

2000; Pennebaker, 1997). Therefore, evaluating how children describe disasters and

other traumatic events may help researchers, theoreticians, and clinicians better

understand their adjustment in the aftermath. A number of theoretical models have

been used to describe the mechanisms through which differences in children's

descriptions of traumatic events may influence psychosocial adjustment. From a

psychodynamic perspective, being able to articulate and fully elaborate on the

circumstances of a traumatic experience may allow individuals to carefully re-

examine the event in a more understandable way and explore the meaning the

experience has on their internal representations of self and others (van der Kolk,

McFarlane, & van der Hart, 1996). This explanation is similar to cognitive models

that emphasize the need to have child victims of trauma identify the traumatic

experience as a discrete, time-limited event that is only one of the many life

experiences shaping their understanding of the world (Vernberg & Varela, 2001).

Doing so may allow individuals to be better able to distance themselves from these

hardships and identify the personal significance and potentially positive benefits of

these circumstances (Adams, Kuebli, Boyle, & Fivush, 1995; Fivush, Berlin, Sales,

Mennuti-Washburn, & Cassidy, 2003a). Based on these models, many researchers

believe that the way individuals recall and describe traumatic experiences can affect

their well-being (Fivush, Sales, Goldberg, Bahrick, & Parker, 2004; Johnson,

Greenhoot, Glisky, & McCloskey, 2005; Pennebaker, Matthias, & Niederhoffer, 2003; Pennebaker & Stone, 2003; Sales, Fivish, Parker, & Bahrick, 2005).

Although aspects of children's narrative descriptions are thought to be related to psychological well-being, more studies are needed to examine the aspects of children's trauma narratives that predict post-trauma adjustment. To address this need, the current investigation evaluated children's descriptions of traumatic events relating to Hurricane Andrew and measurements of their traumatic stress reactions to identify characteristics of the narratives that serve as indicators of adjustment. Based on previous research, four narrative characteristics were selected for evaluation in the study, including narrative elaborateness, narrative coherence, pronoun usage, and internal states terms. *Narrative elaborateness* is often operationalized as the number of words provided in a narrative description (Bucker & Fivush, 1998; Flannagan, Baker-Ward, & Graham, 1995; Leichtman, Pillemer, Wang, Koreishi, & Han, 2000; Peterson, 1994, Peterson, Jesso, & McCabe, 1999; Peterson & Roberts, 2003). *Narrative coherence* refers to the unity and logical organization of the descriptions (Bucker & Fivush, 1998; Fivish, 1991; Peterson, 1994; Peterson & Roberts, 2003), which is frequently measured by the number of terms that provide indicators of temporal sequence (e.g. after that, then, next, first, etc.) or causal relationships (e.g. if, because, so, etc.). *Pronoun usage* is a measure of the frequency of both first-person plural pronoun and first-person singular pronoun usage. Lastly, *internal states language terms* are defined as references to emotions, cognitions, perceptions, and/or physiological states (Bauer, Stark, Lokowski, Rademacher, & Van Abbema, 2005).

One aim of the current investigation was to examine children's narrative descriptions of Hurricane Andrew in the year following the storm and to measure the degree to which these four narrative characteristics varied as a function of the severity of the children's hurricane exposure and other personal characteristics such as age, gender and ethnicity, their coping skills, and the levels of social support they received from others. A second aim was to determine how differences in the characteristics of children's narratives may be related to their psychosocial adjustment over time.

The Impact of Traumatic Exposure on Narrative Characteristics

There is some evidence that the narrative characteristics of children's descriptions about past traumas may vary as a function of the severity of the trauma. In regards to narrative elaborateness, a study conducted among child victims of Hurricane Andrew found that children with more severe exposure to the hurricane, as measured by ratings of damage to their home, provided less information when asked about their experiences during the hurricane 6 months after the event (Bahrick, Parker, Fivush, & Levitt, 1998; Fivush et al, 2004). Nevertheless, a follow-up on this sample 6 years later found that all children provided more elaborate recollections of the hurricane over time, and that those with the most severe exposure provided as much information as those with more moderate levels of exposure, although they did require more prompting by the interviewer (Sales et al., 2006).

In contrast to research on trauma severity and the elaborateness of recollections, research on the use of internal states terms in recollections suggests that trauma severity may be positively related to disclosure of internal states. Both adults

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and children have been shown to use more internal states terms when talking about negative events than when talking about more neutral or positive events (Bauer et al., 2005; Bohanek, Fivush, &, Walker, 2005; Fivush, Hazzard, Sales, Sarfati, & Brown, 2003b). Comparisons of individuals with different levels of exposure to a negative event have led to more nuanced conclusions. For example, research by Fivush and colleagues (2004) found that 3- to 4-year-old child hurricane survivors with high exposure to traumatic stressors during Hurricane Andrew used fewer positive emotions and cognitive terms in their narrative descriptions than children with lower levels of exposure. However, six years after the storm, those with the highest levels of traumatic exposure included more negative emotions and more cognitive processing words than those with lower levels of exposure (Fivush et al. 2004; Sales et al., 2006). Although some research suggests that the use of internal states terms increases when describing negative or traumatic events, research from Greenhoot and colleagues (Greenhoot, Johnson, & McCloskey, 2005) indicates this pattern may only be true for children without a history of chronic stress. In their study of abused and non-abused adolescents, the control group showed increased use of internal states terms for negative memories compared to positive or neutral memories, while the abused group did not. They suggested that children exposed to chronic abuse and domestic violence may not have grown up in a family environment that provided them with opportunities to interpret, label, and express emotions and other internal states related to negative events within the family.

Finally, the severity of traumatic exposure may affect the pronouns children use in their narrative descriptions of the trauma. In the adult literature there is evidence that the written use of first-person plural pronouns (i.e., "we" or "us") increases during times of crises (Gortner & Pennebaker, 2003; Stone & Pennebaker, 2002). Stone and Pennebaker suggested that during times of shared upheavals and crisis people tend to "come together" and display social solidarity. This is thought to cause individuals in crisis to reduce the use of exclusive first-person singular pronouns and increase the use of inclusive first-person plural pronouns. This inclusive sense of crisis, indicated by the use of the plural pronouns, seems to eventually fade when individuals are further removed from the event in time (Gortner & Pennebaker, 2003; Stone & Pennebaker, 2002).

The Role of Child Characteristics

In addition to traumatic exposure, children's narrative descriptions are likely to vary as a function of a number of child characteristics such as age, gender, and ethnicity. At a very basic level, the major advances in language development seen across early childhood contribute to narrative skills, thus, as children and adolescents get older they develop written topics in greater depth and write longer sentences (Byrnes, 1996; Scardamlia & Bereiter, 1986). Further research evaluating speech patterns has suggested that the use of pronouns changes throughout the lifetime (Weintraum, 1981). For example, the frequency of the use of "we" seems to peak during the preteen years and decrease in adulthood, while the use of "I" appears to

follow a U-shaped pattern; peaking during the early school years, dropping during early adolescence, and gradually rising through adulthood.

A child's gender may also affect the use of these linguistic characteristics. Girls generally produce more coherent verbal narratives than boys (von Klitizing, Kelsay, Emde, Robinson, & Schmitz, 2000). Similar gender differences have been observed in children's writing ability, whereby female students are, on average, more proficient in writing than their male counterparts on tests of writing achievement (Campbell, Voelkl, & Donahue, 1997; Feingold, 1993; Hedges & Nowell, 1995; Halpern, 1992). Thus, girls may be expected to produce lengthier narrative descriptions. Gender may also affect the frequency of internal states language in children's narratives. Research with both children and adults has shown that females utilize more internal states language in autobiographical memories than males (Adams et al., 1995; Bauer, Stennes, & Haight, 2003). Therefore, children's gender status should be taken into consideration when evaluating the linguistic characteristics of narratives.

Factors related to ethnicity may also influence narrative characteristics. A variety of differences in communication styles have been identified between Hispanic, African, Asian, European, and Native American cultures (Everett, Proctor, & Cartmell, 1983; Giger & Davidhizar, 1991; Lynch & Hanson, 1992). For example, some traditional Hispanic and Asian cultures may discourage emotional expression and believe that controlling emotions and feelings is a sign of maturity and wisdom (Sue & Sue, 2003). Children who are taught English as a second language may not be

familiar with certain "standard" English vocabulary equivalents, causing their speech to appear "flat," "nonverbal," "uncommunicative," and "lacking in insight" (Romero, 1985). In addition, African Americans, Native American, and Mexican Americans have historically shown lower levels of school performance than their European American classmates (Miller, 1995). These ethnicity-related achievement issues are often confounded with lower socioeconomic status for many ethnic minorities. Still, differences in school performance and writing skills among minority ethnic groups may also be a factor influencing narrative elaborativeness.

The Impact of Social Support and Coping

Children's access to social support and coping strategies may both directly and indirectly influence their descriptions of traumatic events. For example, a child with low levels of social support may receive less assistance from parents and peers in the co-construction and appraisal of a traumatic event, resulting directly in less elaborate traumatic event narratives. Social support and coping may also affect narrative descriptions indirectly by moderating traumatic stress reactions that impact the characteristics of the narratives. The role these reactions have in influencing the narrative descriptions of children are presented in the following section.

Research on social support among children and adolescents indicates that strong social support networks serve as a protective factor against adverse psychological effects of a disaster (Joseph, Yule, Williams, & Andrews, 1993; Kaniasty, Norris, & Murrell, 1990; Vernberg et al., 1996). Although the relation between narrative characteristics and social support has not been carefully studied in

the context of disasters, there is considerable evidence that parent-child conversations about past events help shape the way children recollect past events (Bauer et al., 2005; Sales & Fivish, 2005). Children who receive greater social support from adults may have more opportunities to discuss and co-construct traumatic-related memories with loved ones. Such conversations might assist children in re-examining and elaborating on the details and significance of the event, thereby creating longer, more elaborate narratives. Thus, narrative elaborateness may be positively related to levels of social support. Similarly, levels of social support may also affect the coherence of narratives. Fiese and Wamboldot (2003) found that children with chronic illness produced more coherent narratives in families who reported having more positive communication, problem solving, and affective responsiveness. While this study did not specifically measure social support, other measured family variables positive including communication, problem solving, and affective responsiveness may be evidence of a supportive family environment.

As was mentioned previously, there is evidence that the written use of first-person plural pronouns increases during times of crises (Gortner & Pennebaker, 2003; Stone & Pennebaker, 2002). This may be an indication that levels of social support impact the types of pronouns children use in their narrative descriptions. The increased use of inclusive pronouns (i.e., "we," "our," and "us") following a traumatic event may represent a need for social support or to feel part of a larger social unit, which helps to buffer the effects of traumatic exposure during a time of crisis (Gortner & Pennebaker, 2003). In contrast, some research in the adult literature

indicates that individuals interviewed during a time of crisis that use the word "I" more, rather than "we," have a greater tendency to rely on their own resources, and receive less help from others during crisis situations (Weintraub, 1989). This may be an indication of inadequate social support networks or feelings of social isolation. Nevertheless, the association between social support and the use of plural pronouns in children's descriptions of a traumatic event has not been extensively examined.

It has been shown that children utilize a variety of coping strategies in the wake of traumatic events (La Greca at al., 1996; Paardekooper, de Jong, & Hermanns, 1999; Stallard et al., 2001). Some of these strategies include blaming others, showing anger, social withdrawal, and positive coping strategies that are thought to be more adaptive, such as cognitive reframing and seeking social support. The link between narrative characteristics and specific coping strategies needs to be further examined. Many children withdraw socially as a coping strategy following a traumatic event (La Greca at al., 1996; Stallard et al., 2001). If socially withdrawn individuals use fewer first-person plural pronouns in their autobiographical narrative descriptions because they have limited social interactions, then the evaluation of pronouns in children's descriptions of disaster-related events may serve as an additional indicator of this coping behavior. Similarly, because many children utilize anger-related coping strategies, measures of children's use of internal states and emotional terms in their narrative descriptions may also serve as an indicator of this coping strategy.

Narrative Characteristics and Psychosocial Adjustment

While a variety of factors may influence narrative length, narrative coherence, pronoun usage, and internal states terms in children's descriptions, these narrative characteristics may be related to their behavioral and emotional well-being (Fivush et al., 2004; Johnson et al., 2005; Sales et al., 2005). Many studies have identified an association between the length of trauma narratives and psychosocial adjustment. One study of young children exposed to Hurricane Andrew found that children who provided more information about the hurricane displayed fewer concurrent symptoms of PTSD (Fivush et al. 2004; Sales et al., 2005). However, when these participants were interviewed six years later, the lengths of their narratives were not significantly related to the amount of PTSD symptoms they exhibited. These discrepancies indicate that the association between the length of children's trauma narratives and their severity of PTSD symptoms is inconclusive. However, research in the adult trauma literature suggests that the longer and more detailed a narrative description of a negative or traumatic event, the better. This assumption is based on findings that repeated writing of detailed descriptions of upsetting or traumatic experiences has a variety of benefits, including decreased posttraumatic stress-related symptoms and improved physical health (Campbell & Pennebaker, 2003; Foa et al., 1995; Pennebaker, 1993). One study asked adult female rape victims to verbally recount their assault during nine biweekly individual sessions. Throughout these sessions, the participants' symptoms of PTSD decreased, while the length of their descriptions and the number of internal states and cognitive terms increased (Foa et al., 1995). The

researchers argued that symptoms of PTSD were reduced by bringing images into language and recounting traumatic events.

The study by Foa and colleagues (1995) also showed that an increase in the level of organization of the narratives was related to a decrease in depressive symptoms, while decreased levels of fragmentation were related to a decrease in PTSD symptoms. These results regarding the organization and fragmentation of narratives suggest that the coherence of narrative descriptions may be positively related to psychological well-being. Similarly, a number of studies utilizing story stem assessment techniques to elicit play narratives with children have found significant associations between low levels of coherence in children's narratives and levels of emotional and behavioral problems (Oppenheim, Nir, Warren, & Emde, 1997; von Klitizing et al., 2000). Although these latter studies did not involve the narratives of traumatic events experienced by the children, their results provide additional evidence of an association between narrative coherence and psychological well-being in children.

Furthermore, research has shown that greater use of first-person pronouns in interviews and writing samples is associated with poor psychosocial functioning (Rude, Gortner, & Pennebaker, 2004; Stirman & Pennebaker, 2001; Weintraub, 1981). For example, when asked to write about their experiences in college, depressed college students used more first-person singular pronouns and fewer plural pronouns than non-depressed subjects (Rude et al., 2004). This study incorporated measures of respondents' current and lifetime history of depression. Interestingly,

students who were considered depression-vulnerable (i.e., had a history of depression, but were no longer showing elevated signs of depression) did not use more first-person pronouns than never-depressed individuals. According to these results, first-person pronoun use is related to the experience of depression, and is state-dependent. Therefore, it does not appear to be a personality trait that causes proneness for depression. In addition, first-person singular pronouns have also been linked to symptoms of anxiety (Weintraub, 1989); however, this association has yet to be thoroughly studied.

Several theories may explain the elevated use of first-person pronouns in depressed individuals. First, depressed individuals may be overly self-focused (Mor & Winquist, 2002; Pyszczynski & Greenberg, 1987), which is believed to be a risk-factor for the development of depressive symptoms (Pyszczynski, Hamilton, Herring, & Greenberg, 1989; Robinson & Alloy, 2003). This theory has been used to interpret the higher use of first-person singular pronouns in depressed individuals (Rude et al., 2004; Stirman & Pennebaker, 2001). Another possible explanation relating to traumatic stress reactions is that first-person singular pronoun usage may be associated with social withdrawal, which is one of the most common coping behaviors in response to PTSD (La Greca at al., 1996; Stallard et al., 2001) and depression (Bell-Dolan, Reaven, & Peterson, 1993; Rubin, Chen, McDougall, Bowker, & McKinnon, 1995). Therefore, children and adolescents may use fewer pronouns in their autobiographical narrative descriptions due to the limiting of social interaction as a result of their social withdrawing behavior.

In regards to internal states terms, research on expressive writing with adults has shown that the expression of internal states, such as emotions, perceptions, and cognitions in written descriptions of negative experiences is associated with reduced symptoms of anxiety and depression, as well as improved physical health and adaptive functioning (e.g., Pennebaker & Beall, 1986; Pennebaker, Mayne, & Fracis, 1997; Petre, Booth, & Pennebaker, 1998; Smyth, 1998). While these results suggest that disclosure of internal states has a therapeutic effect and is a sign of adaptive functioning, many of the symptoms of PTSD involve a preoccupation with negative internal states, including feelings of fear, helplessness, or horror, as well as recurrent thoughts or recollections of the event (American Psychiatric Association, 1994). Therefore, disclosure of internal states could also be an indication of psychopathology. Although the links between children's usage of internal states terms and their well-being has not been examined directly, Sales and Fivush (2005) found that children with mothers who used more emotion terms when discussing chronic asthma-related stressors (e.g., medication adherence, participation in athletic events, etc.) had fewer internalizing and externalizing symptoms. On the other hand, children's use of emotion terms when discussing an acute stressor (i.e., an asthma-related visit to the emergency room) with their mothers was negatively related to their well-being.

In another study, Reynolds and colleagues (2001) evaluated the effects of expressive writing (which presumably prompted emotional disclosure) with a group of non-trauma exposed children ages 8-11 years-old. One group was asked to write a

series of journal entries regarding their thoughts and feelings involving negative events they experienced, while two additional groups either wrote about nonemotional events or did not write at all. Thus, although the study did not evaluate the association between the frequency of emotional terms used within the children's narratives and measures of psychological adjustment, they did examine the impact of writing about emotional events on psychological adjustment. Contradicting findings in the adult literature, the results of this study indicated that children who were encouraged to disclose emotions and cognitions in their writing did not show a significant difference in symptoms in comparison to the other groups over the course of the study. The only exception to this pattern was that children who routinely kept a journal prior to participation in the study showed an increase in psychosocial functioning. Thus, only children with extensive experience writing about past events benefited. This suggests that most children may not be cognitively prepared to benefit from expressive writing tasks, but that greater writing or emotional disclosure experience might help.

Both studies by Sales and Fivish (2005) and Reynolds and colleagues (2001) seem to contradict research in the adult literature. This contradiction suggests that there may be developmental differences associated with the disclosure of internal states terms. These differences may be related to the ways traumatic stress symptoms differentially impact children and adults (Fletcher, 2003; Vernberg & Valera, 2001). In regards to PTSD, adults experience avoidance symptoms, including efforts to forget about the event and difficulties recalling aspects of the event, more commonly

than children do (Fletcher, 2003). Therefore, expressive writing techniques may help adults overcome avoidance symptoms through the habituation of aversive stimuli (i.e., memories and emotions) associated with writing about the event. In school-age children, reexperiencing symptoms are more common than avoidance/numbness, and overarrousal cluster symptoms (Fletcher, 2003). Indeed, the high frequency of reexperiencing symptoms among children with PTSD may help to explain why, at least under some conditions, use of internal states language is associated with *greater* psychopathology in children, as in the Sales and Fivush (2005) analyses of mother-child conversations about an acute stressor. Similar findings were observed in a study evaluating children's emotional reactions to Hurricane Hugo; children who reported feeling sad, worried, alone, or angry during the hurricane were most likely to meet the criteria for PTSD symptoms (Shannon, Lonigan, Finch, & Taylor, 1994). In addition, when child survivors of the sinking ferry boat *Jupiter* were asked to describe their experiences, those children who expressed feelings of fear and panic were identified as being at greater risk for developing PTSD (Udwin, Boyle, Yule, Bolton, & O'Ryan, 2000). Collectively, these studies suggest a positive association between the reporting of some internal states (i.e., emotions) and poor psychological adjustment, at least among children.

However, the positive association between internal states language and psychopathology in children has not been uniformly supported. The study by Sales and colleagues (2005) of children's verbal narratives of Hurricane Andrew found that, the only association between internal states terms and symptoms of PTSD was a

marginal correlation between positive emotion terms at Time 1 and PTSD at Time 2. Therefore, while it appears that internal states may be related to traumatic stress reactions, the results of research examining the direction of that association have been mixed. Consequently, more research is needed to better understand the relation between internal states terms and psychological well-being.

Aims and Hypotheses

The current study analyzes longitudinal data from school-aged child participants collected at three time points, beginning in 1992, after Hurricane Andrew made landfall in Florida. Data were collected at 3 months (Time 1), 7 months (Time 2), and 10 months (Time 3) after the storm as part of a larger investigation, directed by Eric Vernberg, Annette La Greca, and Wendy Silverman, of the impact of Hurricane Andrew on children's adjustment (Vernberg et al., 1996; La Greca et al., 1996). The current investigation focuses on how children's traumatic exposure impacted their written recollections of the "worst aspects" of the storm at Times 1 and 2, taking into account children's characteristics, coping strategies, and level of social support, and assesses how aspects of these recollections are related to their long-term psychosocial adjustment at Times 1, 2, and 3.

There were two major aims of this study. The first aim was to evaluate how four narrative characteristics (narrative elaborateness, coherence, usage of pronouns, and internal states terms) in children's recollections of the worst aspects of the hurricane at Times 1 and 2 were related to traumatic exposure over time, when accounting for the potential influences of age, gender, ethnicity, and measures of

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coping and social support. Very little research on the predictors of these narrative characteristics has been conducted, thus, much of this analysis was exploratory. Nevertheless, based on previous research suggesting that children exposed to very severe stressors report less about those stressors than children exposed to more moderate stressors (e.g., Bahrick et al., 1998; Fivush et al. 2004; Sales et al., 2006), it was hypothesized that children with high levels of exposure would produce shorter and less coherent descriptions of their traumatic experiences. In terms of internal states, it was suspected that there may be a positive association between the number of internal states terms and the number of traumatic exposures based on research showing that children use more internal states language when discussing highly negative events, and because more severe exposure to the hurricane is likely to have been more emotionally arousing than less severe exposure. The children's narrative characteristics were also expected to be related to age, gender and ethnicity, with older age, female gender, and white, non-Hispanic ethnicity producing higher levels of each narrative characteristic.

Level of social support and coping strategies were also expected to relate to the characteristics of children's narrative descriptions. In regards to social support, great social support was expected to be related to longer and more coherent narrative descriptions, because children with access to social support should have more opportunities to discuss and co-construct longer and more detailed narratives. Social support was expected to be related to the more frequent use of first-person plural pronouns and inversely related to the frequency of first-person singular pronouns

because first-person plural pronouns may serve as an indicator of the shared experiences of individuals, such as peers, parents, and teachers, who might provide social support. Finally, some aspects of coping were expected to be related to certain narrative characteristics. Specifically, children using social withdrawal coping strategies were expected to use fewer first-person plural pronouns, while children utilizing anger-related coping strategies were expected to use more internal states and emotional terms in their narrative descriptions.

The second major aim of this study was to evaluate how narrative elaborateness, coherence, and usage of pronouns and internal states terms were related to measures of well-being and how they predicted the long-term trajectories of psychosocial adjustment. Three measures of psychosocial adjustment evaluating symptom levels of PTSD, anxiety, and hopelessness were examined. Because of the results from previous research examining narrative lengths, briefer narrative responses at Times 1 and 2 were expected to predict poorer long-term psychosocial adjustment across the three data collection periods. The narrative coherence of the participants' descriptions was also predicted to be inversely related to measures of psychosocial adjustment at each time point, given that poor narrative coherence is linked to emotional difficulties (Oppenheim, Nir, Warren, & Emde, 1997). In regards to pronoun usage, because studies with adults that have shown higher levels of first-person pronoun use in individuals with symptoms of poor psychosocial functioning (Rude et al., 2004; Stirman & Pennebaker, 2001; Weintraub, 1981), the use of first-person singular pronouns at Times 1 and 2 was expected to correlate with post-

hurricane psychosocial maladjustment. Lastly, because of the inconsistent results regarding the association be internal states and children's long-term psychosocial adjustment, analysis of the possible link between internal states and psychopathology was exploratory and no specific hypothesis was made.

Methods

Participants

At Time 1, three months after the storm, data were collected from three elementary schools affected by Hurricane Andrew. These schools were located in southern Dade County, Florida, which was one of the worst areas affected by the storm (Miami Herald Press, 1992). After gaining permission from the school board, the parents of 1,086 third, fourth, and fifth graders at these schools were sent letters in English and Spanish requesting permission to allow their child to participate in the study. A follow-up letter was sent to families who did not reply within five days. The parents of 677 children responded to the letter. A total of 589 children (87%) were given parental consent to participant in the study, while 88 (13%) had parents who declined. Verbal assent was obtained from the 589 children. Among these 589 children, 21 were absent during the first data collection period, leaving complete Time 1 data for 568 participants.

Fifty-five percent of the participants in the study are female and the sample is ethnically diverse (44% European American, 26% Hispanic, 22% African American, 3% Asian American, and 5% unknown ethnicity). Participants were between the ages of 7- and 12-years-old with an almost equal proportion of participants belonging to

each grade (31.3% in grade 3, 31.9% in grade 4, and 36.8% in grade 5) at Time 1. Indicators of socioeconomic status from census data collected within the catchment areas of the schools included in the study indicate a range of occupational (38% managerial or professional, 35% technical or sales, 10% service, 5% operator-laborer) and educational levels (88% completed high school, 36% completed college, 14% completed graduate or professional degrees).

The number of participants at Time 2 (7 months post-disaster) was reduced by 8.3% (n = 47). An additional 12.6% (n = 72) were not available at Time 3 (10 ten months post-disaster). Thus, a total of 442 children (187 boys, 255 girls) completed all three assessments. According to La Greca and colleagues (1996), at Time 2, 22 (3.9%) of the Time 1 children had relocated, 17 (3.0%) were absent, and 14 (2.5%) declined to participate further. At Time 3, an additional 8 (1.4%) children had moved away, 37 (6.5%) were absent, and 28 (4.9%) declined to participate further. La Greca and colleagues (1996) compared children who completed all three assessments and those who did not. They found that these two groups of children were similar in grade, gender, ethnicity, and initial PTSD symptomatology. Of the 442 participants, 334 completed the Kidcope prompt. Data from these 334 participants was used for the analyses.

Procedures

Data were collected for Time 1 from November to December of 1992, approximately 3 months after the landfall of Hurricane Andrew. The primary research investigators, clinical psychology graduate students, and advanced undergraduate

research assistants, administered the measures after receiving training in the study procedures. At Times 1 and 2, the measures were administered during two 35-50 minute sessions on separate days. At Time 3 data were collected during a single 30 minute session.

The children were administered the measures in groups of 10 to 25 students while at school. To help ensure that the measures were completed correctly, one or more members of the research team were present for every 10 children in order to answer questions. The students were informed that they could stop participating in the study at any time and that there were no right or wrong answers to the questions. They were also informed that children who seemed very upset or bothered by the hurricane would be identified to their parents and school counselors. After obtaining the participants' written assent, each of the items included on the study were then read out loud while children followed along and marked their answers. While the questions were being administered, a research assistant circulated throughout the room to answer any questions the participants may have had.

Measures

A variety of measures were collected during Time 1 and Time 2. To elicit the children's narrative descriptions of events related to the hurricane, the children were asked to recollect the three worst things that happened because of Hurricane Andrew as part of the Kidcope, a measure of children's coping skills. Responses to specific questions on this measure were used to index coping skills. To measure levels of trauma exposure, the HURTE was also administered. In addition, a measure of social

support and coping skills, the Social Support Scale for Children and Adolescents (SSSC), was also collected during Time 1 and Time 2. Assessments of psychosocial adjustment, including measures of PTSD (the Posttraumatic Stress Disorder Reaction Index for Children; RI), anxiety (Revised Children's Manifest Anxiety Scale; RCMAS), and hopelessness (Hopelessness Scale for Children), were administered at all three time points. These measures are described in detail in the sections that follow.

Kidcope. The Kidcope has been used to identify coping processes in children and adolescents from a variety of trauma-exposed populations (Paardekooper et al., 1999; Stallard et al., 2001; Vernberg et al., 1996). The first segment of the Kidcope requires children to identify specific stressors relevant to the population in which the measure is being used. For this study the segment read, "The worst things that happened to me because of the hurricane were…" and then asked the participant to write three upsetting things that happened to them because of the hurricane. This prompt was worded slightly differently at Time 2, asking each child to "write down three upsetting things that happened to you since the hurricane and still upsets you now." The children's responses, or narratives, to these open-ended prompts were the central focus of this study and were evaluated for elaborateness, coherence, first-person pronoun usage, and mention of internal states.

As part of the Kidcope protocol, these open-ended prompts were followed by 15 self-report items used to identify a variety of coping strategies used among children (Spirito, Stark, & Williams, 1988). These 15 items were presented in a 4-

point Likert scale and were identically worded on both of the Time 1 and Time 2 versions of the Kidcope. Principal component analysis (PCA) was used to identify four coping factors among the 15 Kidcope items by Vernberg and colleagues (1996). The first factor included 6 items (try to see the good side of things, try to fix the bad things by thinking of answers, try to fix the bad things by doing something or talking to someone, try to calm myself down, try to feel better by spending time with others, do something like watch TV or play a game to forget it). This first factor was labeled *Positive Coping*. The second factor contained 3 items (blame myself for causing the bad things; blame others for causing the bad things; yell, scream, or get mad) and was labeled *Blame and Anger*. Two 2-item factors were also identified; *Wishful Thinking* (I wished the bad things had never happened, I wished I could make things different) and *Social Withdrawal* (I stayed by myself, I kept quiet about the bad things that happened), according to labels that were given to them in previous studies with the Kidcope (Spirito et al., 1988; Spirito et al., 1992). When this PCA was conducted, items number 1 and 15 ("just tried to forget it" and "didn't do anything because the bad things couldn't be fixed," respectively) were crossloaded on two or more factors. For their analyses, Vernberg and colleagues (1996) deleted these crossloaded items from their analyses.

     Hurricane-Related Traumatic Experiences (HURTE). The severity of children's hurricane exposure was indexed by their responses to the HURTE, a measure developed to evaluate children's exposure to life threatening experiences during the hurricane as well as hurricane-related disruptions and loss in the weeks

that followed (Vernberg et al., 1996). The HURTE is a 17 item measure which allows respondents to answer "yes" or "no." The items are divided into three rationally-derived categories. The categories include: *Perceived life threat* ("At any time during the hurricane, did you think you might die?"), *Life-threatening experiences* ("Did you get hurt during the hurricane?"), and *Loss-disruption experiences* ("Was your home badly damaged or destroyed by the hurricane"). These categories included 1, 6, and 10 items, respectively.

Social Support Scale for Children (SSSC). The SSSC (Harter, 1985) is a 24-item measure which was used to assess the participants' perceptions of social support from parents, classmates, teachers, and close friends. Each subscale contains six items scored on a 4-point scale, with higher values reflecting greater social support. A number of studies have shown support for the reliability and validity of the measure, with internal consistencies ranging from .72 to .83 for the SSSC subscales in different samples of children and adolescents (Dubow & Ullman, 1989; East, Hess, & Lerner, 1987; Harter, 1985).

Posttraumatic Stress Disorder Reaction Index for Children (RI). The RI (Pynoos et al., 1987) is a 20-item self-report measure used to assess children's PTSD symptoms experienced in the last month prior to data collection. Each item on the RI is typically rated on a 5-point Likert scale; however, the measure was modified to a 3-point scale to make it more developmentally appropriate for the children in the study. The modified version used values of 0, 2, and 4 to allow comparisons with established categories of symptom severity (Frederick, Pynoos, & Nader, 1992).

Children with mild stress reactions are thought to have total scores ranging from 12 to 24; more moderate cases range between 25 and 39; and scores above 40 are the most severe. One additional modification was made to make the measure appropriate for children: the item, "Do you feel bad because of something you thought or did during Hurricane Andrew, or because of something you did not do," was restated as two separate items, and the higher (more severe) of the child's responses to the two items was used for scoring purposes.

The total score for all 20 items of the RI was used as an overall index of posttraumatic stress symptoms. The total score on the RI demonstrates high internal consistency (Cronbach's α = .89; Vernberg et al., 1996). The total RI scores have also been found to be positively correlated with exposure to trauma (Lonigan et al., 1994; Vernberg et. al. 1996). The RI items also form three symptom clusters of posttraumatic stress: re-experiencing the event, numbing/avoidance, and hyper-arousal. Internal consistencies for the three clusters of data, as indexed by Cronbach's alpha, were .75, .64, and .57, respectively.

Revised Children's Manifest Anxiety Scale (RCMAS). The RCMAS (Reynolds & Richmond, 1978) is a 37-item self-report measure of anxiety. The items each require a "yes" or "no" answer. The RCMAS also typically includes 9 lie/social desirability items; however, these were not included in this data collection. A summative score was calculated with the remaining 28 possible items. Three factor scores can be obtained from the RCMAS: *physiological anxiety* (e.g., "Often I feel sick in my stomach"), *worry/oversensitivity* (e.g., "I worry about what is going to

happen"), and *concentration* (e.g., "It is hard for me to keep my mind on my school work"; Reynolds & Paget, 1983). In efforts to maximize the parsimoniousness of the analyses and eliminated redundancies in the models, only the participants RCMAS total scores were used. The RCMAS has been shown to have good internal consistency (α = .88 to .89) and convergent validity (r = .70) with other measures of anxiety (Dierker et al., 2001).

Hopelessness Scale for Children. The Hopelessness Scale for Children is a 17-item self-report measure of hopelessness (Kazdin, French, Unis, Esveldt-Dawson, & Sherick, 1983). Each item requires a "yes" or "no" response (i.e., "All I can see ahead of me are bad things, not good things"). High scores indicate greater levels of hopelessness and negative perceptions of the future. According to Kazdin and colleagues (1986), the Hopelessness Scale has produced good internal consistency (α = .97); however, they revealed that Item 4 ("I can imagine what my life will be when I'm grown up") should not be used because of the item's negative influence on the internal consistency of the scale. Thus Item 4 was not included in this study.

Although formal measures of depressive symptoms have primarily been used in studies of psychosocial adjustment and pronoun usage, a measure of depression was not included in the battery of questions presented to the participants of this study. This was due to limits that were placed on the number of measures that could be used in the initial study. Given that hopelessness have been found to be significantly correlated with measures of depression (Kazdin et al., 1986), it was determined that the Hopelessness Scale for Children would serve an adequate proxy.

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Coding

When asked to describe the three worst things about Hurricane Andrew the participants in this study provided a variety of responses. The words the participants used in each of the responses were counted by graduate research assistants and upper level undergraduate psychology students and coded for narrative elaborateness, narrative coherence, pronoun usage, and internal states terms. Twenty percent of the transcripts were coded by two coders to determine reliability, and the average percent agreement was 94.5% (range = 90-98%). A description of the coding rubric is provided below.

Narrative Elaborateness. The total number of words, or raw word count, provided in each participant's narrative description is used as an indication of elaborateness. Misspelled words presented in distinct discernable units were also included in each of the participants' raw word count totals.

Narrative Coherence. The coherence of the participants' narratives were estimated by the number of terms they used that provided indication of temporal sequence (e.g., after that, then, next, first, etc.) and causal relationships (e.g., if, because, so, etc.). This coding procedure is commonly used to index coherence (Buckner & Fivush, 1998; Fivush, 1991; Peterson & Roberts, 2003), and is based on the assumption that, because narratives describe a series of events, the use of temporal and causal markers linking events serves as a measure of coherence.

Pronouns. First-person singular pronouns were identified as utterances including "I", "me," "my," and "mine" (i.e., "my house was damaged"), while first-

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person plural pronouns were identified as "we," "us," "our," and "ours" ("we had to move out in four days"). In instances where multiple pronouns were used in the same sentence (i.e., "*I* thought *our* roof was going to fly off"), the pronouns were recorded separately.

Internal states language. The participants' responses were coded for the frequency of internal states language. The terms were identified and coded based on a coding scheme adapted from Bauer et al. (2003) and others (e.g., Greenhoot et al., 2005). Specifically, coders counted the number of internal states terms in the following categories: (a) emotion words, (b) cognitive terms, and (c) perception terms. Emotional terms were identified as words describing emotions or emotional expressions. Both explicit and implicit emotion-related words were coded. Explicit emotional terms were identified as terms where an actual emotion is stated (e.g., "I was *scared*"), while implicit terms include descriptions of behaviors commonly associated with emotions (e.g., *laughing*, *crying*, etc.) or references to emotion-related psychological disorders (e.g., "My mother's *depression* was really bad"). Cognitive terms were words identified as cognitive processes related to thoughts about experiences (e.g., "I *wonder* if we'll ever move again") and metacognitive terms related to memories (e.g., "I keep *remembering* what happened"). Perception terms included words related to sensory perceptions (e.g., *see*, *hear*, *smell*, *felt*, *taste*, etc.). Because the emotion terms were almost exclusively negative, positive and negative emotional terms were not coded separately. A fourth category of internal states terms, physiological state terms (e.g., tired, hurt, dead), was also coded, but this category

was excluded from the analyses because the majority of the physiological terms used referenced the death of a loved one, which was highly correlated with the severity of the participants' hurricane exposure, potentially confounding the results.

Results

Design and Statistical Analyses

Preliminary and descriptive analyses assessed mean values and standard deviations for the different narrative characteristics across T1 and T2. Two sets of inferential analyses were then conducted to address the major aims of the study. First, to evaluate how traumatic exposure may be related to children's narrative elaborateness, coherence, and usage of pronouns and internal states terms, a series of repeated measures general linear model (GLM) analyses were used each with a different narrative characteristic as the dependent variable and with time (1 or 2) as the repeated measure. Measures of the gender, age, ethnicity, severity of traumatic exposure, coping strategies, and levels of social support served as the independent variables. The second set of analyses was designed to address the second major aim of the study, which was to examine the associations between narrative characteristics and psychosocial adjustment. To this end, a separate series of repeated measures general linear model analyses was conducted each with one of the psychopathology measures as dependent variables (RI, RCMAS, and Hopelessness Scale for Children) and with time (1, 2 or 3) as the repeated measure. Independent variables in these analyses included measures of the gender, age, ethnicity, severity of traumatic exposure, and narrative characteristics.

Descriptive Analyses

The mean scores of each linguistic feature for each time period are illustrated in Table 1, and the percentages of participants who used any coherence-related terms, first-person singular and plural pronouns, and internal states terms across the two time periods are presented in Figure 1. Table 1 and Figure 1 show that there were some differences in the characteristics of the narratives collected at Time 1 and Time 2. Subsequent repeated measures GLM revealed that two narrative characteristics significantly decreased over time, including, use of first-person singular pronouns, $F(1,316) = 24.55$, $p < .0001$, and first-person plural pronouns, $F(1,316) = 4.03$, $p < .05$. Therefore, it appears that when controlling for narrative length and other contributing factors, Time 2 narratives contained fewer first-person singular and plural pronouns.

Table 1

Means (Standard Deviations) and the Effects of Time on Four Characteristics of

Children's Narrative Descriptions Collected at 3 and 7 Months Post Hurricane

Andrew (*N* = 334)

	3 Months	7 Months	
Narrative Characteristics	*M (SD)*	*M (SD)*	*F*(1,315)
Narrative Elaborateness[a]	17.21 (7.09)	12.07 (7.13)	3.23
Narrative Coherence[b]	0.19 (0.51)	0.14 (0.40)	0.49
First-Person Singular Pronouns	2.59 (1.58)	1.61 (1.50)	24.55***
First-Person Plural Pronouns	0.25 (0.62)	0.091 (0.40)	4.03*
Internal States Terms	0.33 (0.75)	0.40 (0.73)	0.01

Note. F values are derived from repeated measures GLM analyses, controlling for all between-subjects

variables, including: gender, age, ethnicity, elaborativeness, level of exposure, coping style, and levels

of social support.

[a]Indicated by raw word count. [b]Indicated by total number of coherence-related terms.

* p < .05, ** p < .01, *** p < .001.
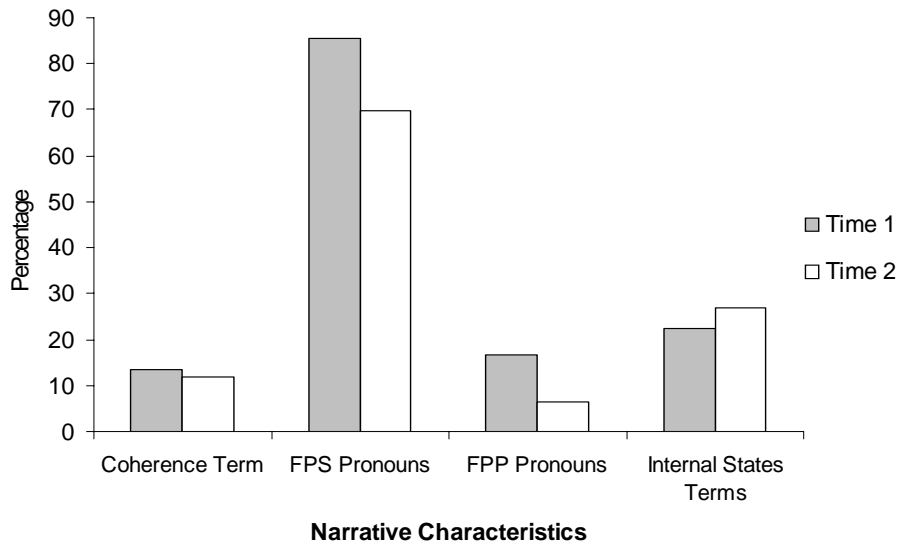
Figure 1. The percentage of participants that used specific narrative characteristics in their descriptions of the "Worst" events relating to Hurricane Andrew from data collected 3 (Time 1) and 7 (Time 2) months after the storm. Narrative characteristics in the figure include coherence terms, first-person singular (FPS) pronouns, first-person plural (FPP) pronouns, and internal states terms.

Analyses using Pearson zero-order correlations provided an initial evaluation of the associations between the different narrative characteristics. These correlations are presented in Table 2. Correlations among these measures were at a low to moderate magnitude. Scores on narrative elaborativeness at Time 1 significantly correlated with narrative elaborativeness at Time 2. With the exception of internal states language, each of the addition narrative characteristics followed a similar pattern, with the characteristic at Time 1 correlating with the corresponding characteristic at Time 2. Elaborativeness in both narratives was significantly correlated with many of the narrative characteristics, suggesting the need to control

Table 2.

Zero-Order Correlations Between Narrative Characteristics at Time 1 and Time 2.

	Time 1					Time 2				
	Elaborate	Coherence	FPS	FPP	Internal States	Elaborate	Coherence	FPS	FPP	Internal States
Time 1										
Elaborate	-									
Coherence	.47**	-								
FPS Pronouns	.43**	.12*	-							
FFP Pronouns	.26**	.16**	-.21**	-						
Internal States	.12*	.14**	.03	.01	-					
Time 2										
Elaborate	.23**	.13*	.13**	.08	-.02	-				
Coherence	.09	.12*	-.04	.02	.02	.30**	-			
FPS Pronouns	.08	.04	.14**	.03	-.07	.58**	.15**	-		
FFP Pronouns	.05	.11*	-.07	.13**	-.01	.20**	-.01	-.08	-	
Internal States	-.02	-.01	.01	-.01	.01	.23**	.06	.16**	-.10	-

Note: N = 334 for correlation analyses. Elaborate = Elaborativeness. Coherence = Narrative coherence; FPS = First-person singular pronouns; FPP = First-person plural pronouns.

* *p* < .05. ** *p* < .01.

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for elaborativeness when examining the predictors of these variables. In the Time 1 narrative, use of coherence terms was also related to each of the narrative characteristics. In both narratives, an inverse association was found between the use of the two pronouns type, suggestion that children who use more first person singular pronouns used less first person plural pronouns, and vise-versa. Conversely, use of first-person singular pronouns was positively correlated with internal states language, but only in the Time 2 narrative.

Means and standard deviations of measures of hurricane exposure, coping, social support, and psychological adjustment are presented in Table 3. Previous analyses of these variables (La Greca et al., 1996; Vernberg et al., 1996) revealed that, although symptoms of PTSD decreased overtime, a large number of participants continued to exhibit PTSD symptoms 10 months later. When the three PTSD symptom clusters were examined separately, most children met criteria for the Reexperiencing cluster, while fewer children met criteria for the Avoidance/Numbing and Hyperarousal cluster across each of the time points. Furthermore, levels of traumatic exposure, coping and social support were each identified as significant predictors of psychological adjustment following the storm. Because these variables have been thoroughly described in other publications (La Greca et al., 1996; Vernberg et al., 1996), interested readers are encourage to review these articles for a more through description. The current analysis will focus on how these variables relate to the certain characteristics of the trauma narratives.

Table 3

Mean (Standard Deviations) Values for Hurricane Exposure, Coping, Social Support, and Measures of Traumatic Stress

	Post-hurricane time point		
	1	2	3
	(N = 568)	*(N = 521)*	*(N = 442)*
Variable	*(3 months)*	*(7 months)*	*(10 months)*
HURTE	5.21 (2.73)		
Kidcope Subcales			
Positive Coping	13.57 (4.18)	12.92 (4.21)	
Blame/Anger	4.25 (1.70)	4.11 (1.58)	
Wishful Thinking	6.07 (1.83)	5.49 (1.92)	
Social Withdrawal	6.19 (2.13)	5.95 (2.17)	
SSSC			
Parent	21.40 (3.53)	21.28 (3.49)	
Classmate	18.71 (4.01)	18.61 (4.33)	
Close Friend	19.98 (4.22)	20.06 (4.39)	
Teacher	20.06 (4.12)	20.00 (4.23)	
RI Total	29.96 (17.80)	24.45 (16.37)	21.32 (15.23)
Reexperiencing	9.80 (6.56)	7.70 (6.29)	6.38 (5.56)
Avoidance/Numbing	6.97 (4.94)	5.48 (4.45)	4.59 (4.16)
Hyperarousal	6.55 (4.58)	5.55 (4.20)	5.24 (4.36)
RCMAS Total	10.27 (7.43)	8.71 (7.39)	7.54 (6.97)
Physiological	3.52 (2.67)	3.18 (2.70)	2.87 (2.59)
Worry/Oversensitivity	4.47 (3.47)	3.81 (3.47)	3.28 (3.28)
Concern/Concentration	2.36 (2.09)	2.12 (2.28)	1.62 (2.04)
Hopelessness Total	4.49 (2.73)	4.68 (2.91)	4.01 (2.71)

Note: HURTE = Hurricane-Related Traumatic Experiences scale; SSSC = Social Support Scale for Children; RI = Posttraumatic Stress Disorder Reaction Index for Children; PTSD = posttraumatic disorder; RCMAS = Revised Children's Manifest Anxiety Scale; Hopelessness = Hopelessness Scale for Children.

Repeated Measures GLM Analyses of Narrative Characteristics

Additional analyses using Pearson zero-order correlations provided an initial evaluation of the associations between narrative characteristics and measures of child characteristics, coping and social support. In the correlation analyses all available data was used to help identify associations that might exist. Significant correlation values are presented in Table 4. As expected, greater age and female gender were significantly positively correlated to measures of elaborativeness, coherence, and pronoun usage. Contrary to expectations, ethnicity was not, and none of the demographic variables showed an association with the use of internal states terms. There were, however, a number of different significant correlations between the Kidcope and SSSC subscale scores with each of the narrative characteristics measured. Trauma severity negatively correlative to coherence at Time 1 and a positive correlation with first-person singular pronouns at both time points.

To better identify the predictors of the narrative characteristics, each narrative characteristic was used as a dependent variable in a repeated measures general linear model, with time as the repeated measure variable. Several between-subjects variables from Time 1 and Time 2 were also placed in the model, including the demographic variables of age, sex, and ethnicity, the trauma exposure measure (HURTE), and measures of coping (Kidcope) that were collected at Time 1 and Time 2. Preliminary analyses had indicated that participants' scores on the SSSC subscales did not significantly predict any of the narrative characteristics identified in the study, therefore these scores were eliminated from the final models. Finally, the models

Table 4

Correlations between Measures of Narrative Characteristics, Trauma Exposure, Child

Characteristics, Coping, and Social Support.

	Elaborativeness		Coherence Terms		First-Person Singular		First-Person Plural		Internal States	
Variables	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
Sex	.20**	.26**	.09*	.07	.10*	.18**	.09*	.13*	.09	.02
Age	.11*	.12*	.11*	.07	.11*	.08	-.01	.03	.04	-.03
Ethnicity	-.05	.07	.02	-.03	-.02	.06	-.01	.03	.04	-.03
HURTE	.01	.04	-.11*	-.06	.16**	.12*	-.07	-.09	-.01	.03
Kidcope Subscales (T1)										
Positive	.06	.08	.05	-.01	.04	.12*	-.02	-.03	.10*	.13**
Blame and Anger	-.04	-.08	-.04	-.08	.01	-.01	-.05	-.11*	.06	.07
Wishful Thinking	.07	.08	.05	.04	.03	.09	.01	-.07	.06	.08
Social Withdrawal	.01	.04	.04	-.01	.01	.04	.02	-.03	.06	.13*
Kidcope Subscales (T2)										
Positive	.05	.16**	.07	.06	.01	.12*	.06	-.08	.02	.08
Blame and Anger	-.02	-.03	-.08	-.04	.01	.04	-.01	-.10*	.01	.05
Wishful Thinking	.06	.16**	.03	.09	.11	.14**	.01	-.11*	.04	.10
Social Withdrawal	.03	.09	.02	-.01	.05	.08	.02	-.09	.05	.10*
SSSC Subscales (TI)										
Parents	.06	.01	.07	.10	.06	-.01	.03	.08	-.03	-.05
Classmates	.01	.02	.01	.03	-.08	-.09	.03	.12*	.01	-.04
Close Friends	.09*	.10	.03	.13**	.01	-.01	.01	.07	-.08*	-.10*
Teachers	.04	-.02	.01	.08	.01	.02	.05	-.02	.06	.01
SSSC Subscales (T2)										
Parents	.03	-.01	.09	.10	.03	-.04	.01	.01	-.03	-.04
Classmates	.05	-.01	.05	.01	-.03	-.04	.08	.04	-.09	-.04
Close Friends	.09	.00	.06	.07	.02	-.02	-.03	-.01	-.01	-.13*
Teachers	.09*	.01	.06	.09	.04	.01	.04	-.07	.01	.01

Note: T1 = Time 1; T2 = Time 2; HURTE = Hurricane-Related Traumatic Experiences scale; SSSC = Social Support for

Children; RI = Posttraumatic Stress Disorder Reaction Index for Children; RCMAS = Revised Children's Manifest

Anxiety Scale; Hopelessness = Hopelessness Scale for Children.

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

predicting narrative coherence, pronouns, and internal states terms controlled for narrative length, to eliminate possible redundancies between overall elaborateness and these other narrative qualities.

Elaborativeness. The repeated measures GLM predicting elaborateness (narrative length) indicated that the only significant predictors were the demographic variables (see Table 5). There was a significant main effect for gender ($\beta_{gender\_}$ = 0.23), across both narrative interviews, such that female participants generated longer narratives. Likewise, older participants also provided longer narrative descriptions ($\beta_{elaborativeness\_}$ = 0.11). There was also a significant interaction between time and ethnicity on elaborativeness, $F(4,317) = 2.85$, p < .05. Although univariate analyses show that although there was no influence of ethnicity on narrative length at Time 1, $F(4,315) = 0.91$, $p = .4023$, there was a significant difference among ethnic groups in the length of their narratives at Time 2, $F(4,321) = 4.84$, $p < .0008$. Contrast analyses using Tukey's studentized range revealed that European American children's narratives had significantly fewer words than Hispanic (Tukey's studentized range [HSD] test, $F[1,416] = 15.16$, p < .0001) and African American children (Tukey's studentized range [HSD] test, $F[1, 416] = 5.77$, p < .01).

Coherence. The results of the model predicting narrative coherence revealed significant interactions elaborativeness and time on coherence terms at Time 1, $F(1,216) = 21.74$, $p = <.0001$, and Time 2, $F(1,216) = 17.26$, $p = <.0001$ (see Table). Univariate analyses revealed that coherence scores at Time 1 were significantly related to elaborativeness at Time 1 only ($\beta_{elaborativeness} = 0.13$), and the number of

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Table 5

F-*values for the General Linear Models Predicting Elaborativeness and Coherence in Narrative*

Descriptions of the "Worst Aspects of the Hurricane."

	Elaborativeness			Coherence Terms		
Variable	Across Time	T1	T2	Across Time	T1	T2
Gender	30.36***			0.93		
Age	5.87*			0.03		
Ethnicity	1.57	0.90	4.65 [a] ***	0.90		
Elaborativeness (T1)					85.13***	0.01
Elaborativeness (T2)					0.01	24.14***
HURTE	0.43			1.38		
Kidcope Subscales (T1)						
Social Withdrawal	1.00			0.29		
Blame	0.47			0.01		
Positive Coping	0.49			0.07		
Wishful Thinking	0.91			0.87		
Kidcope Subscale (T2)						
Social Withdrawal	0.56			0.38		
Blame	0.19			3.71		
Positive Coping	0.37			0.44		
Wishful Thinking	0.12			1.73		

Note: T1 = Time 1; T2 = Time 2; T3 = Time 3; HURTE = Hurricane-Related Traumatic Experiences scale. *F*-values corresponding to effects averaged across time are listed in the Across Time column. Variables with interactions with time are listed in columns T1 and T2.

[a] Elaborativeness scores from Hispanic and African American participants were significantly higher than score from European American participants.

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

coherence terms used in Time 2 narratives were related to elaborativeness at Time 2 only ($\beta_{elaborativeness} = 0.32$). The fact that the number of coherence terms was predicted by the overall number of words in the narratives should not be surprising because the

additional inclusion of coherence terms adds to the overall number of words, and subsequent elaborativeness of the narrative. In contrast, narrative coherence was not significantly predicted by age, gender, traumatic exposure, coping, or social support.

Pronoun usage. As in the analyses predicting coherence terms, the repeated measures GLM predicting first-person singular pronouns indicated effects of elaborativeness (see Table 6). Elaborativeness measured at Time 1 interacted with time, $F(1,315) = 50.73$, $p < .0001$, as did elaborativeness at Time 2, $F(1,315) = 51.31$, $p < .0001$. As expected, univariate analysis indicated that elaborativeness at Time 1 was significantly related to the frequency of first-person singular pronouns at Time 1 ($\beta_{elaborativeness} = 0.62$), whereas elaborativeness at Time 2 was significantly related to the frequency of first-person singular pronouns at Time 2 ($\beta_{elaborativeness} = 0.82$). Therefore, individuals with longer responses used more first-person singular pronouns, regardless of when the narratives were obtained.

First-person singular pronoun scores were also significantly related to HURTE scores across both time periods, ($\beta_{HURTE} = .16$), indicating that individuals with higher rates of hurricane-related traumatic exposure utilized more first-person singular pronouns in their narrative responses. First-person singular pronouns were also related to the Kidcope Wishful Thinking subscale at Time 2, ($\beta_{Wishful\ Thinking} = .18$). These results indicate that participants who reported more wishful thinking coping at Time 2 also used more first-person plural pronouns. In contrast, reported use of positive coping strategies at Time 2 predicted the use of fewer first -person singular

Table 6

F-*values for the General Linear Models Predicting First-Person Singular and Plural Pronoun*

Usage in Narrative Descriptions of the "Worst Aspects of the Hurricane."

	First Person Singular Pronouns			First Person Plural Pronouns		
Variable	Across Time	T1	T2	Across Time	T1	T2
Gender	2.03			1.83		
Age	0.95			1.14		
Ethnicity	0.68			0.26		
Elaborativeness (T1)		64.92***	1.26		27.11***	0.34
Elaborativeness (T2)		0.09	116.79***		0.08	10.23**
HURTE	6.25*			0.73		
Kidcope Subscales (T1)						
Social Withdrawal	0.24			0.35		
Blame	0.33			0.39		
Positive Coping	0.33				3.21	0.78
Wishful Thinking	0.03			0.12		
Kidcope Subscale (T2)						
Social Withdrawal	0.44			0.07		
Blame	0.03			0.09		
Positive Coping	4.85*				8.03**	1.11
Wishful Thinking	7.95**			5.10*		

Note: T1 = Time 1; T2 = Time 2; T3 = Time 3; HURTE = Hurricane-Related Traumatic Experiences scale.

F-values corresponding to effects averaged across time are listed in the Across Time column. Variables

with interactions with time are listed in columns T1 and T2.

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

pronouns, ($\beta_{Postive\ Coping}$ = -.17). First person singular pronouns did not vary as a

function of age, gender or ethnicity.

The repeated measures GLM predicting first-person plural pronouns showed

that there was a significant interaction between time and measurement of positive

coping on first-person plural pronouns at Time 1, Time 1, $F(1,315) = 3.99$, $p < .05$

(see Table 5). Nevertheless, univariate analyses results indicated that positive coping at Time 1 did not significantly predict first-person pronoun usage at the two time points. The model also revealed significant main effects across time for Kidcope Wishful Thinking at Time 2 ($\beta_{Wishful\ Thinking}$ = -.10), indicating that individuals with higher rates of wishful thinking utilized fewer first-person plural pronouns in their narrative responses at both time points. Finally, elaborativeness at Time 1, $F(1,315) =$ 22.27, $p = <.0001$ interacted significantly with time (see Table 5). As might be expected, univariate analysis indicated that elaborativeness at Time 1 was significantly related to the frequency of first-person plural pronouns at Time 1 ($\beta_{elaborativeness}$ = 0.17), but not the frequency of first-person plural pronouns at Time 2, ($\beta_{elaborativeness}$ = -0.01).

Internal states language. The analysis of internal states language showed that the only predictor was narrative length. There was a significant interactions between time and elaborativeness measured at Time 1, $F(1,315) = 5.53$, $p < .05$, and a significant interaction between time and elaborativeness measured at Time 2, $F(1,315) = 10.43$, $p < .01$ (see Table 7). Following a similar pattern of other univariate analyses of the narrative characteristics, elaborativeness at Time 1 was significantly related to the frequency of internal states terms at Time 1 only ($\beta_{elaborativeness}$ = 0.10), and elaborativeness at Time 2 was significantly related to the frequency of internal states terms at Time 2 ($\beta_{elaborativeness}$ = 0.17), but not at Time 1.

Table 7

F-*values for the General Linear Models Predicting Internal States Terms in Narrative*

Descriptions of the "Worst Aspects of the Hurricane."

	Internal States Terms		
Variable	Across Time	T1	T2
Gender	0.85		
Age	0.84		
Ethnicity	0.15		
Elaborativeness (T1)		3.05*	0.79
Elaborativeness (T2)		0.28	14.95***
HURTE	0.01		
Kidcope Subscales (T1)			
Social Withdrawal	0.01		
Blame	0.69		
Positive Coping	1.47		
Wishful Thinking	0.36		
Kidcope Subscale (T2)			
Social Withdrawal	0.83		
Blame	0.11		
Positive Coping	0.47		
Wishful Thinking	0.09		

Note: T1 = Time 1; T2 = Time 2; T3 = Time 3; HURTE = Hurricane-Related Traumatic Experiences scale.

F-values corresponding to effects averaged across time are listed in the Across Time column. Variables

with interactions with time are listed in columns T1 and T2.

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

Repeated Measures GLM Analyses of Psychological Adjustment

Pearson correlations were used to provide an initial examination of the associations between narrative characteristics and measures of psychological adjustment across each time period. Significant correlation values are presented in Tables 8 and 9. Correlations among these measures were moderate to low in magnitude. As shown in these tables, measures of elaborativeness, first-person singular pronouns, and internal states correlated significantly with many of the measures of psychological adjustment. Time 1 narrative coherence showed a negative correlation with hopelessness scores at Time 2, while Time 2 first-person plural pronouns also showed a negative correlation with hopelessness scores at Time 3. To further evaluate the combined contributions of these narrative characteristics to the prediction of psychological well-being, another series of general linear models was tested with the characteristics as predictors. Each model controlled for the influence of gender, age, ethnicity, and severity of traumatic exposure (see Table 10). Preliminary analyses, however, indicated that narrative coherence and first person plural and singular pronouns failed to significantly relate to any of the measures of adjustment when other factors were in the model. Thus, to reduce the number of predictors and simplify the models, coherence and pronouns were removed from the models.

Table 8

Correlations between Measures of Narrative Characteristics and Posttraumatic Stress Disorder

	Elaborativeness		Coherence Terms		First-Person Singular		First-Person Plural		Internal States	
Variables	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
RI Total (T1)	.09*	.13*	.02	-.04	.13**	.11*	-.01	-.06	.14*	.15***
Re-experiencing (T1)	.11*	.10*	.02	.01	.09*	.10*	.03	-.07	.16**	.10*
Avoidance (T1)	.10*	.15**	.03	-.05	.15***	.13**	.01	.01	.12**	.11*
Hyperarousal (T1)	.05	.07	.04	-.01	.11*	.05	-.03	-.04	.08	.11*
RI Total (T2)	.05	.17**	.01	.01	.05	.11*	.01	-.03	.07	.22***
Re-experiencing (T2)	.07	.17***	-.01	.06	.05	.11*	-.01	-.06	.06	.15**
Avoidance (T2)	.01	.01	.03	.07	.04	.09	.01	-.02	.06	.22***
Hyperarousal (T2)	.03	14**	-.01	-.02	.06	.08	-.02	-.02	.05	.18***
RI Total (T3)	.01*	.16**	.01	.01	.13**	.09	.08	-.02	.10*	.15**
Re-experiencing (T3)	.16**	.15*	.05	-.02	.09*	.08	.10*	.05	.08	.01
Avoidance (T3)	.06	.09	.03	-.03	.07	.05	.07	-.04	.07	.13*
Hyperarousal (T3)	.04	.10	.01	-.05	.07	.04	.07	-.04	.01	.17***

Note: T1 = Time 1; T2 = Time 2; T3 = Time 3; RI = Posttraumatic Stress Disorder Reaction Index for Children.

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

Table 9

Correlations between Measures of Narrative Characteristics, Anxiety, and Hopelessness

	Elaborativeness		Coherence Terms		First-Person Singular		First-Person Plural		Internal States	
Variables	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
RCMAS Total (T1)	.07	.18***	-.01	-.03	.10*	.16**	-.02	-.07	.09*	.21***
Physiological (T1)	.05	.15***	-.06	-.02	.06	.14**	-.02	-.07	.08	.18***
Worry/Oversensitivity (T1)	.09*	.21***	.03	-.03	.12**	.17**	.01	-.07	.08	.20***
Concern/Concentration (T1)	.07	.09	-.01	-.02	.09*	.11*	.01	-.07	.10*	.17**
RCMAS Total (T2)	.03	.17***	-.01	.04	.03	.12*	.05	.01	.06	.21***
Physiological (T2)	-.01	.16***	-.01	.04	.04	.14**	-.01	-.01	.06	.19***
Worry/Oversensitivity (T2)	.06	.17***	.03	.04	.03	.12*	.07	.01	.07	.22***
Concern/Concentration (T2)	.02	.12*	-.04	.02	.01	.06	.03	.02	.06	.16**
RCMAS Total (T3)	.09	.09	-.01	-.05	.11*	.07	.04	-.04	.08	.15**
Physiological (T3)	.09	.11*	-.01	-.01	.10*	.10	.04	.01	.05	.18**
Worry/Oversensitivity (T3)	.10*	.11*	.02	-.04	.13**	.05	.05	-.04	.06	.12*
Concern/Concentration (T3)	.05	.01	-.04	-.09	.06	.04	.02	-.08	.10	.12*
Hopelessness (T1)	-.03	-.01	-.06	.05	-.03	.03	-.01	-.05	-.01	.07
Hopelessness (T2)	-.05	-.03	-.09*	-.03	-.03	-.04	-.01	.01	-.03	.11*
Hopelessness (T3)	-.03	-.02	-.09	.01	-.03	.02	-.01	-.15**	-.03	.03

Note: T1 = Time 1; T2 = Time 2;T3 = Time 3; RCMAS = Revised Children's Manifest Anxiety Scale; Hopelessness = Hopelessness Scale for Children.

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

Posttraumatic stress symptoms. The repeated measures GLM analysis of overall PTSD symptoms (as measured by the RI) revealed significant interactions between time and level of traumatic exposure, $F(1,264) = 12.40$, $p < 0001$. Examination of the univariate tests indicated that trauma severity significantly predicted PTSD symptoms at all three time points, and differences in the magnitude of the parameter estimates were likely responsible for the interaction ($\beta_{Hurte\ T1} = 8.81$, $\beta_{Hurte\ T2} = 5.32$, and $\beta_{Hurte\ T3} = 3.48$). Thus, not surprisingly, children with more severe hurricane exposure had more PTSD symptoms. These results were shown in previous studies (La Greca et al., 1996; Vernberg et al., 1996); however this model also revealed significant main effects on the RI across time for the elaborativeness of children's narratives at Time 1, ($\beta_{elaborativeness} = 1.39$). In addition to the influence of narrative elaborativeness, there were significant main effects on the RI across time for internal states language produced at Time 1, ($\beta_{Internal\ States} = 2.32$), and internal states language produced at Time 2, ($\beta_{Internal\ States} = 3.03$). Individual repeated measures GLM analyses were also used with each of the three RI PTSD symptoms clusters (re-experiencing the event, numbing/avoidance, and hyper-arousal). These separate analyses of the symptoms clusters revealed that the effects of elaborativeness and internal states were similar across all three types of symptoms. These patterns illustrate that even when controlling for trauma severity, children who disclosed more information or reveal their internal states when writing about the hurricane had higher levels of PTSD symptomology.

Table 10

F-Values for the General Linear Models Predicting Poor Post-Hurricane Psychosocial Adjustment

Variable	RI				RCMAS				Hopelessness			
	Across Time	T1	T2	T3	Across Time	T1	T2	T3	Across Time	T1	T2	T3
Gender	2.53				10.46**				0.35			
Age	0.62				2.17				11.22**			
Ethnicity	2.02				1.63				4.42[a] ***			
HURTE		83.75***	34.49***	13.60***		63.77***	24.48***	7.02*	18.74***			
Internal States (T1)	8.37**					0.31	0.64	2.24	0.28			
Internal States (T2)	12.81***				16.79***				3.34			
Elaborativeness (T1)	5.13*				2.25				0.05			
Elaborativeness (T2)	0.26				0.66				0.76			

Note: T1 = Time 1; T2 = Time 2; T3 = Time 3; HURTE = Hurricane-Related Traumatic Experiences scale; RI = Posttraumatic Stress Disorder Reaction Index for Children; RCMAS = Revised Children's Manifest Anxiety Scale; Hopelessness = Hopelessness Scale for Children. *F*-values corresponding to effects averaged across time are listed in the Across Time column. Variables with interactions with time are listed in columns T1, T2, and T3.

[a] Hoplessness scores from Hispanic participants were significantly higher than score from European American and African Americans participants.

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

Anxiety. The repeated measures GLM analysis of anxiety symptoms (as measured by the RCMAS) revealed an interaction between the severity of traumatic exposure and time, $F(2,265) = 9.82$, $p < .0001$. As in the analyses of the RI, examination of the univariate tests indicated that trauma severity significantly predicted anxiety symptoms at all three time points, but the interaction is likely due to variation in the magnitude of the parameter ($\beta_{HURTE\ T1} = 3.22$; $\beta_{HURTE\ T2} = 2.25$; $\beta_{HURTE\ T3} = 1.19$). Although there also was a significant interaction between time and internal states language measured at Time 1, $F(2,265) = 3.15$, $p = .04$, univariate tests showed that internal states language at Time 1 did not significantly predict anxiety at any of the three time points. The model did reveal significant main effects across the three time points for gender, ($\beta_{Gender} = 1.05$), and internal states language measured at Time 2, ($\beta_{Internal\ States} = 1.71$). Similar to the evaluation of PTSD symptoms, the results illustrate that even when controlling for the significant effects of trauma severity and gender, children who disclosed more of their internal states when writing about the hurricane had higher levels of anxiety symptomology.

Hopelessness. The repeated measures GLM analysis of hopelessness (as measured by the Hopelessness Scale for Children) revealed no main effects or significant interactions involving time. The model did show significant main effects across the three time points for age, ($\beta_{Age} = -0.44$), ethnicity, $F(4,285) = 4.91$, $p < .001$, and severity of traumatic exposure, ($\beta_{HURTE} = 0.60$). Contrast analyses using Tukey's HSD were used to explore the differences between ethnic groups. Hispanic participants reported higher levels of hopelessness than both European-Americans

(Tukey's studentized range [HSD] test, $F (1,416) = 18.94$, $p < .0001$), and African Americans (Tukey's studentized range [HSD] test, $F (1,416) = 8.17$, $p < .01$). Unlike the other measures of psychological adjustment, hopelessness was not significantly related to any of the narrative characteristics.

Discussion

Among narrative characteristics, elaborativeness and usage of pronouns were shown to be demographic characteristics (i.e., age, gender and ethnicity), level of traumatic exposure, and coping strategies. Of the four narrative characteristics, only elaborateness and internal states language were significantly related to measures of psychological well-being, specifically PTSD and anxiety. These latter findings were significant when controlling for variables such as gender, ethnicity, narrative length, and severity of traumatic exposure.

An interesting finding regarding pronoun usage was that both first-person singular and first-person plural pronouns changed over time, with a decrease in usage from Time 1 to Time 2 when controlling for overall narrative length and other relevant variables. These results are consistent with research by Pennebaker and his colleagues showing that first-person plural pronouns generally peak immediately after a crisis and then decrease over time (Gortner & Pennebaker, 2003; Stone & Pennebaker, 2002). It should be noted that there are many differences between the work by Pennebaker and colleague and the current analysis. Pennebaker and colleagues' analyzed text from internet chat rooms and newspapers in the days following a traumatic event, whereas the current study elicited narrative descriptions

directly from children months after a hurricane. Despite these variations in the sample, mode of data collection, and collection periods, both studies showed a consistent reduction in use of first-person plural pronouns, suggesting that this may be a robust phenomenon. The decrease in first-person plural pronouns from Time 1 to Time 2, when considered alone, could be interpreted as a return to baseline following an increase in social solidarity immediately after a tragic event. This explanation is consistent with the Pennebaker and colleagues' interpretation. However, first-person singular pronouns also decreased over time in the current analysis, which suggests an alternative interpretation: the combined decease in pronoun usage may indicate that as the temporal distance from the event increases, children de-personalize their experiences by providing fewer makers of active participation in the hurricane-related events. This reduction may reflect changes in children's perceptions of the individual impact of the traumatic experiences or efforts to emotionally distance themselves from the event.

In regards to the first aim of this study, which was to evaluate how children's narrative characteristics in descriptions of the worst aspects of the hurricane were related to traumatic exposure over time after accounting for the potential influences of age, gender, ethnicity, and measures of coping and social support, a few significant predictors were identified. The results support a positive association between age and narrative elaborativeness and are consistent with existing research (Byrnes, 1996; Scardamlia & Bereiter, 1986); however there was no evidence supporting prior research that age influences the use of pronouns (Weintraum, 1981). Weintraum's

research indicated that the frequency of different pronouns changed over the life course, therefore the relatively small age range of the participants in the current study may explain the absence of an age effect on pronoun usage. There was also an effect of gender on the level of elaborativeness; female participants produced longer narrative descriptions that included more internal states language, which is consistent with research suggesting a gender bias for writing ability (Campbell, Voelkl, & Donahue, 1997; Feingold, 1993; Hedges & Nowell, 1995; Halpern, 1992).

In terms of ethnic group differences, there was little evidence of differences in the levels of internal states terms, which was inconsistent with the assumption of ethnic differences in the disclosure of emotions (Sue & Sue, 2003). However, there were some interesting differences in narrative elaborativeness. While controlling for severity of exposure, Hispanic and African American participants provided longer narrative descriptions than their European American classmates. The mechanisms influencing these differences are unclear. One explanation might be that the Hispanic and African American participants had greater writing ability and fluency than the European American participants, and therefore wrote longer narratives. Although plausible, this explanation seems unlikely given the academic disadvantages some members of these groups face (Miller, 1995). Another explanation might be that members of these groups had higher levels of PTSD, which was shown to be related in subsequent analyses to narrative elaborativeness. This explanation also seems unlikely because when controlling for narrative elaborativeness, there were no ethnic group differences in the severity of PTSD symptoms. Therefore, more research is

needed to better understand the mechanisms influencing these ethnic group differences in elaborativeness.

The participants' severity of traumatic exposure was significantly related to first-person singular pronoun use, with children with higher rates of exposure using more first-person singular pronouns. One possible interpretation of these results is that children with severe traumatic exposure may be more likely to have experienced and describe traumatic events of an individual or personal nature that necessitate the use of first-person singular pronouns (e.g., harm to self). Another interpretation may be that children with high levels of traumatic exposure may have a greater tendency to individualize traumatic events, which influences their use of first-person singular pronouns in their descriptions. Despite these possible explanations, more research is needed to better identify the mechanisms that influence the association between first-person singular pronouns and traumatic exposure.

Although there was an association with first-person singular pronouns and trauma severity, severity of traumatic exposure did not seem to influence the other narrative characteristics measures in the study. This indicates that severity of traumatic exposure alone does not influence the elaborativeness, coherence, or emotional terms children use to describe their experiences. These findings seem inconsistent with studies on chronic traumatic exposure (e.g., domestic violence) that indicate children provide shorter and less internal states-laden autobiographical memories (Grych, Wachsmuth-Schlaefer, & Klockow, 2002; Johnson et al., 2005). This apparent inconsistency may reflect differences in the effects and circumstances

related to chronic and acute traumatic exposure. Children exposed to chronic traumatic events such as domestic violence may have limited access to family environments which support the interpretation, labeling, and expression of emotions and other internal states. Conversely, children exposed to acute traumatic events such as a natural disaster may generally come from more typical family environments that promote identification and expression of emotions and internal states.

None of the narrative characteristics were found to be significantly associated with social support. These results were surprising in light of research on the role of parental involvement in narrative development (Fiese & Wamboldot, 2003; Sales & Fivish, 2005). Children with more access to social support were expected to have more opportunities to co-construct and add detail to the descriptions of hurricane-related events. However, this explanation was not supported in this analysis. Perhaps more specific measures of parental support and communication are needed to evaluate the role parents have in their children's development of trauma narratives.

Among narrative characteristics, only pronoun usage was related to coping. Children who reported using wishful thinking coping strategies more often used first-person singular pronouns and fewer first-person plural pronouns. Because the Kidcope Wishful Thinking subscale included items such as "I wished the bad things had never happened" and "I wished I could make things different," one possible explanation is that the association between pronouns and wishful thinking may reflect an internal locus of control. Children with a tendency to internalize events may have been more apt to identify themselves as the single participant in their descriptions of

traumatic events. First-person plural pronouns also showed a significant interaction between time and the Positive Coping subscale. This subscale included items such as "trying to look on the bright side" and "trying to clam myself down." Therefore, children who identify shared participation in their descriptions of traumatic experiences by using more plural pronouns utilize more adaptive coping strategies, which seems to imply that using first-person plural pronouns might be an indication of adaptive adjustment. Nevertheless, neither first-person singular or plural pronoun usage were identified as predictors of psychological adjustment. When considering this discrepancy and the very limited research that has been done in this area, more study is needed to better understand the association between coping and pronoun usage.

With respect to the second aim of the study, the results evaluating the associations between the narrative characteristics and measures of psychological well-being were mixed. Contrary to predictions based on the existing literature (Oppenheim et al., 1997; Rude et al., 2004; Stirman & Pennebaker, 2001; Weintraub, 1981), neither the frequency of pronouns used nor narrative coherence was associated with poorer psychosocial adjustment. Conversely, both elaborativeness and the use of internal states language displayed associations with poorer psychosocial adjustment, with more detailed narrative descriptions associating with higher levels of PTSD symptoms and more internal states language relating to more symptoms of PTSD and anxiety. These findings appear to conflict with research in the adult literature indicating that writing more elaborate and emotion-laden narrative descriptions is

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related to adaptive functioning (e.g., Pennebaker & Beall, 1986; Pennebaker et al., 1997; Petre et al., 1998; Smyth, 1998).

A few important factors may explain the apparent incongruence of these findings. First, trauma narrative research studying elaborativeness and use of internal states language in adults recollections has generally focused on narratives in the context of treatment. These narratives are typically prescribed as a therapeutic task where adults are asked to purposefully write in journals at different intervals, typically within a week or a month. The procedure used in the current study was very different: participants were asked to write on two separate occasions, months apart, as part of a larger research study. These differences in the context of the narrative writing assignment may have differentially impacted levels of engagement and thoughtfulness in the activity, which may have subsequently influenced the relation between elaborativeness and internal states usage and well-being.

Second, temporal proximity to the event may be an additional influential factor. Many of the adult studies on elaborativeness and internal states language in trauma narratives have focused on events such as physical or sexual abuse, which took place years before the completion of the trauma narrative. In contrast, narratives from the children in this study were collected within months of the hurricane. Perhaps immediately following an event emotions are too intense for individuals to benefit from disclosing detailed information regarding their experiences; this may be particularly true for children, whose emotion regulation skills are still developing. With a longer delay, it may be easier for individuals to identify and evaluate emotions

as well as derive meaning from negative experiences in a detailed and therapeutic way.

Third, there may be important developmental aspects of traumatic stress symptoms that uniquely influence the elaborativeness and disclosure of internal states children's narrative descriptions. Based on these results and those in the existing literature, reexperiencing symptoms are more common in school-age children than avoidance/numbness, and overarrousal cluster symptoms (Fletcher, 2003). These symptoms may cause children to more vividly reexperience traumatic events than adults. It is not until the later stages of puberty that PTSD symptoms become evenly distributed across the three clusters and coincide with the incidence rates of adults (Carrion, Weems, Ray, & Reiss, 2002; Fletcher, 2003). Furthermore, adults have better developed metacognitive abilities and capacity to control cognitions (Kuhn, 2000; Kuhn & Pease, 2006), which may allow them to more easily control their cognitive reexperiencing of an event. This may explain why adults try more often to actively forget about traumatic events and have higher rates of avoidant symptoms.

Several limitations to the current study deserve mentioning. First, partially due to the nature of the Kidcope prompt, the children's narrative responses were quite brief. This forced groups of items (i.e., internal states) to be collapsed into a single variable due to the low frequency of some of the responses. Had the prompt been developed in such a way to elicit a longer, more detail response, additional analyses of narrative characteristics may have been used. For example, a number of studies

have evaluated overgeneralization of narrative descriptions; however, the responses in the current study were too brief to code for this specific narrative feature.

Second, the current study only provided one narrative prompt regarding the worst aspects of the hurricane. It would have been useful to obtain narrative descriptions of non-traumatic events to serve as a comparison. A few studies have been able to evaluate important differences in how traumatized children describe traumatic and non-traumatic events (Bauer et al., 2005; Sales, Fivish, & Peterson, 2003). Additional research evaluating how trauma victims identify positive and negative aspects of an event may have implications for research on resiliency and interventions following traumatic exposure.

Third, although no link between social support and the narrative characteristics was identified, a number of studies have shown that parents influence how children remember and disclose details of traumatic events (Bauer et al., 2005; Sales & Fivish, 2005). Evaluating how parents talk to their children about hurricanes and other traumatic events may help illuminate the influence parents have on their children's narrative descriptions and corresponding posttraumatic psychosocial adjustment.

To summarize these findings, variables such as gender, age, ethnicity, traumatic exposure, and coping were differentially related to measures of the narrative characteristics, including: narrative elaborateness, coherence, pronoun usage, and internal states. Of these characteristics, only internal states language and narrative elaborateness were significantly related to measures of psychological well-

being. The findings regarding internal states language may have particularly important implications for risk assessment, theory-building, and treatment of traumatic stress reactions. Understanding the manner and mechanisms through which internal states are related to children's experiences and adjustment may help researchers and theoreticians to be more effective in explaining, predicting, and reducing difficulties endured by children following disasters and other traumatic experiences. Furthermore, clinicians may find it useful to target trauma victims' internal states, identified through narrative descriptions, to reduce the risk for long-term distress and developmental disturbance.

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