

An Exploratory Study of Posttraumatic Growth in Children Following a Natural Disaster

Cheryl H. Cryder, MA, Ryan P. Kilmer, PhD, Richard G. Tedeschi, PhD, and Lawrence G. Calhoun, PhD
University of North Carolina at Charlotte

This study extends L. G. Calhoun and R. G. Tedeschi's (1998) model of posttraumatic growth (PTG), positive change resulting from the struggle with trauma, to children by exploring the construct among youngsters who experienced Hurricane Floyd and the subsequent flooding. Despite burgeoning interest in PTG, few studies have examined the phenomenon among non-adults. This first systematic study of PTG in children explores hypothesized linkages among PTG and social support, competency beliefs, and ruminative thinking. Results suggest that competency beliefs relate to PTG and that a supportive social environment and ruminative thinking are associated with positive competency beliefs. Contrary to expectations, social support did not relate to rumination. Findings testify to the merit of studying the PTG process in children. Clinical implications and future directions are considered.

Keywords: posttraumatic growth, children and trauma, resilience

This pilot effort sought to extend Calhoun and Tedeschi's (1998, 1999) model of posttraumatic growth (PTG; i.e., positive change experienced as a result of the struggle with major loss or trauma) to children by exploring the construct among youngsters who experienced a natural disaster and its aftermath (Hurricane Floyd and the subsequent flooding). Although research has identified correlates of PTG and supported the hypothesized model among adults (Calhoun & Tedeschi, 2004), few studies have examined PTG among non-adults. Preliminary evidence suggests that this growth process occurs, to some degree, among adolescents (Horowitz, Loos, & Putnam, 1997; Milam, Ritt-Olson & Unger, 2004); however, despite the substantial body of work regarding children's responses to stress or trauma (Donaldson, Prinstein, Danovsky, & Spirito, 2000; Grant et al., 2003; Osofsky, 2004), the literature does not appear to include any published studies investigating PTG in children. Exploring the nature of PTG in children and enhancing understanding of the phenomenon can yield useful information to clinicians and other professionals working with children who have experienced trauma.

Conducting such work raises salient issues involving the cognitive maturity and "psychological mindedness" (i.e., intrapersonal aware-

ness and insight) of youngsters. A critical component of the PTG process is thought to involve one's struggle with his or her new reality, which facilitates a constructive cognitive processing of trauma (i.e., productive rumination) that can alter schemas and consolidate changed perspectives on self, others, and one's new life and way of living (Tedeschi & Calhoun, 1995). The affective quality of the learning and change in PTG may distinguish it from other developmental processes and, in considering the potential for PTG in children, it is necessary to address how the manner in which they process traumatic events compares with that of adults. Children's variability in cognitive capabilities across different stages may influence their appraisal and understanding of trauma (e.g., Hasan & Power, 2004), the attributions they make about their circumstances, their repertoire of coping skills and strategies, their ability to marshal resources effectively, and their capacity to attend to and report on internal states.

Indeed, Milam et al. (2004) found a positive relationship between age and PTG among adolescents, positing that a specific level of cognitive maturity is necessary to find meaning or identify salient changes or benefits as a result of trauma and its aftermath. Given that the growth process appears to involve a cognitive sophistication that allows recognition of both losses and gains, it is unclear whether something akin to PTG is possible for children and how similar the process might be to that observed in adults.

The literature in this emerging area (Cadell, Regehr, & Hemsworth, 2003; Park, 1998; Tedeschi & Calhoun, 2004) and parallel research in child risk and resilience and stress and coping (Luthar, 2003; Masten & Coatsworth, 1998) can guide research examining the PTG process among youngsters. Although PTG and resilience share conceptual variance, they are distinct constructs—whereas *resilience* typically refers to a dynamic developmental process reflecting positive adaptation or competence in the face of challenging life conditions (Luthar, Cicchetti, & Becker, 2000; Masten, 2001), *PTG* refers to a growth process by which survivors are profoundly affected by trauma in a way that *transforms*. *PTG* refers to positive changes that go *beyond* effective coping and adjustment despite adversity; it involves movement beyond pre-

Cheryl H. Cryder, MA, Ryan P. Kilmer, PhD, Richard G. Tedeschi, PhD, and Lawrence G. Calhoun, PhD, Department of Psychology, University of North Carolina at Charlotte.

This article is based on Cheryl H. Cryder's Master's thesis. She is now in private practice in Winston-Salem, North Carolina. Many thanks go to East Carolina University and Drs. Lane Geddie, Susan McCammon, and Angela Smith for their significant contributions to the study. Our sincere gratitude goes to the counselors and principals of the Pitt County schools and the children and families who participated; without them the present research would not have been possible.

For reprints and correspondence: Ryan P. Kilmer, PhD, Department of Psychology, University of North Carolina at Charlotte, 9201 University City Boulevard, Charlotte, NC 28223-0001. E-mail: rpkilmer@email.uncc.edu

trauma adaptation, a qualitative change in functioning across domains. That said, although many survivors recognize some benefit and positive change, they often still report distress and struggle in the trauma's aftermath. Thus, many individuals reporting PTG may also report less emotional well-being than those evidencing resilient adaptation.

Despite varying target populations, definitions, and methods, several factors are consistent across adult PTG research and research focused on children's successful coping and adaptation in the face of adversity. Building on these bodies of work and the hypothesized processes involved for PTG in children (see Figure 1), we selected three factors of interest: (a) ruminative thinking, the ability to cognitively process negative events to allow inclusion

of positive appraisals; (b) the availability and utilization of positive social support sources; and (c) competency beliefs, positive appraisals of one's ability to cope and adjust in the face of stress or trauma. We hypothesized that (a) study children would report PTG and (b) those children who experienced frequent event-related rumination, accompanied by adequate sources of social support, would be more likely to both make positive attributions about their competence in coping and report greater PTG.

Method

Participant Recruitment and Description

Participants were recruited from three schools in Pitt County, North Carolina, where 50% of students were evacuated or displaced from their

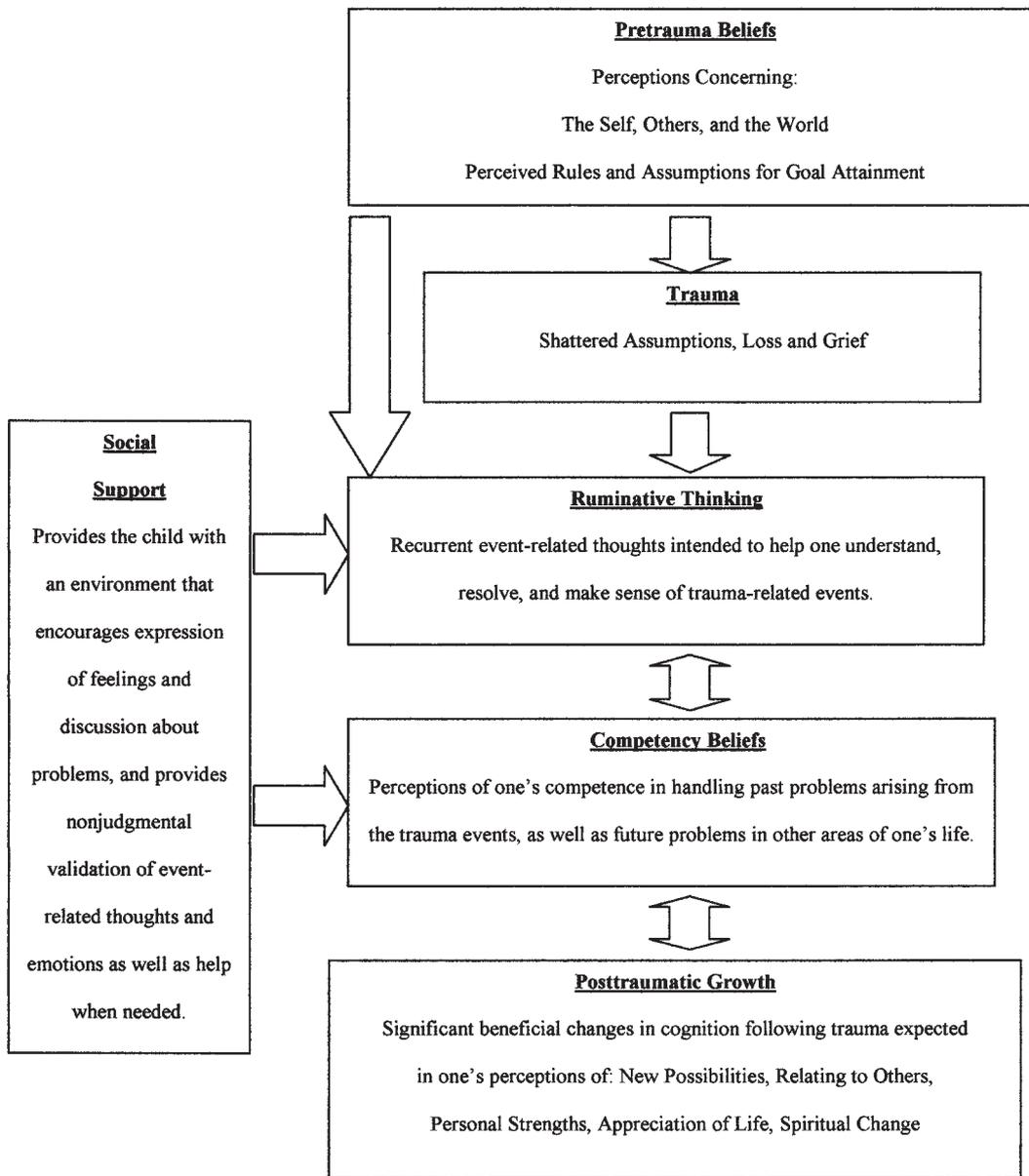


Figure 1. Hypothesized model of posttraumatic growth in children.

This document is copyrighted by the American Psychological Association or one of its allied publishers. This article is intended solely for the personal use of the individual user and is not to be disseminated broadly.

homes because of the flooding associated with Hurricane Floyd. East Carolina University (ECU) staff provided names of 363 youngsters referred to their group intervention for those severely impacted by the September 1999 flooding. Regardless of their child's involvement in the intervention, parents of all 363 were sent a letter inviting their child's participation. Because of a lack of forwarding addresses following the families' relocations, 51 families could not be contacted. Of the 312 contacted parents, 46 (15%) provided study consent for their child (only 3 had attended the ECU intervention). The 28 girls and 18 boys were 6 to 15 years old ($M = 9.54$, $SD = 2.64$), and, on average, 4.80 people ($SD = 1.36$) lived in their homes. The sample's 76% minority composition (about 65% African American) approximated the make-up of participants' schools. Data were collected about 1 year after the flooding.

Procedures

Following written assent, measures were administered in modified structured interview format to small groups of children. Each child responded on his or her form.

The Rumination Scale for Children. This five-item adaptation ($\alpha = .75$) of the adult Rumination Scale (Calhoun, Cann, Tedeschi, & McMillan, 2000) measures ruminative thinking, defined as recurrent event-related thoughts that help one understand, resolve, and make sense of trauma-related events (Martin & Tesser, 1996). Using a 4-point scale, children estimated the deliberateness, intrusiveness, and content of their thoughts (e.g., "I try to think of some good things that happened to me after the flooding").

The Inventory of Social Support for Children (ISS-C). This adaptation of the Inventory of Social Support (Hogan & Schmidt, 2002) measures perceptions of the availability of nonjudgmental validation of thoughts and emotions, opportunities to talk about problems and feelings, and the availability of help when needed. On Part 1, five items assess children's experiences of social support on a 4-point scale. On Part 2, children indicate up to 10 important others and evaluate them on being available to listen, telling the child that his or her feelings are okay, and conveying understanding. The alpha for Part 1 of this adaptation was unacceptable ($\alpha = .43$), so only Part 2 ($\alpha = .85$) was used.

The Children's Competency Beliefs Scale. This five-item adaptation of the Child's Coping Efficacy Scale (Weyer & Sandler, 1998) measures children's perceptions of their ability to handle problems arising from the trauma, as well as problems that may arise in other areas. Children rated the effectiveness of their coping strategies in responding to past, present, and future problems on a 4-point scale ($\alpha = .73$).

The Posttraumatic Growth Inventory for Children (PTGI-C). This 21-item adaptation of the Posttraumatic Growth Inventory (Tedeschi & Calhoun, 1996) assesses positive changes associated with having to deal with traumatic stressors. On a 4-point scale (1–4), the measure reflects five domains of PTG: New Possibilities (e.g., "I have new things that I like to do, e.g., hobbies, toys, etc."), Relating to Others (e.g., "I feel closer to other people than I did before"), Personal Strength (e.g., "I learned I can count on myself"), Appreciation of Life (e.g., "I learned that life is important"), and Spiritual Change (e.g., "I understand religious ideas more"). Alpha for the PTGI-C was .89. Each child was also asked to rate the severity of the traumatic event (i.e., the Hurricane Floyd flooding).

Results

Demographics

All *t* tests comparing the means for the study's measures across gender were nonsignificant, although girls ($M = 16.07$, $SD = 8.45$) tended to have higher scores than boys ($M = 11.67$, $SD = 6.76$) on social support, $t(44) = 1.86$, $p < .10$. Age correlated

reliably with the ISS-C Part 2 total score ($r = .326$, $p < .05$) but not with other measures.

Correlational Analyses: Exploring Hypothesized Relationships Among Study Variables

Ruminative thinking correlated significantly with competency beliefs ($r = .382$, $p < .01$) but not with social support or PTG. Social support (i.e., Part 2 of the ISS-C) significantly correlated with competency beliefs ($r = .351$, $p < .05$), and no significant correlations were found between the ISS-C Part 2 measure and ruminative thinking or PTG. In addition to the detected links with both ruminative thinking and social support, competency beliefs significantly correlated with the PTGI-C ($r = .547$, $p < .01$).

PTG

There was considerable variability in the youngsters' self-ratings of PTG. Scores ranged from 37 to 84 (minimum possible = 21, maximum = 84), with a mean of 65.11 ($SD = 11.87$). As noted, PTGI-C scores correlated significantly with competency beliefs but not with rumination or social support. Analyses exploring the links between ratings of the severity of the flooding and study variables found no significant correlations with the total scores of the PTGI-C or with any of the other measures or demographic variables.

Discussion

This project demonstrates the merit of investigating PTG among child and adolescent populations and provides preliminary support for the hypothesized model in this age band. Findings suggest that, as predicted, children's competency beliefs related significantly to indicators of PTG in children following exposure to major stress or trauma. This finding is consistent with resilience research suggesting the importance of positive expectations and beliefs about one's competencies and one's future, which may influence how a child perceives an event, the manner in which he or she responds to stress or trauma, and the effort he or she sustains in grappling with the traumatic circumstances (Werner & Smith, 1982; Wyman, Cowen, Work, & Kerley, 1993).

Also as predicted, a supportive social environment appears related to the participant children's positive competency beliefs. Although further work is needed to better understand these associations and assess their generalizability to other samples, the finding underscoring the role of support fits well with research in resilience, in which children's perceptions of positive sources of support have consistently discriminated those children who adapted well from those who exhibited difficulties (see, e.g., Luthar, 2003). Adults can help children understand the meaning of events and the appropriateness of their reactions. Furthermore, sound support sources encourage expression of feelings, provide nonjudgmental validation of event-related thoughts and feelings, and assist with more instrumental aspects of support when needed, roles that may both enhance a child's competency beliefs and contribute to the constructive rumination process.

However, contrary to expectations, support did not relate to ruminative thinking in this sample. Also, although a relationship existed between rumination and competency beliefs, children's

reports of rumination did not correlate directly with PTG. The specific nature of rumination's relation to competency beliefs in children remains unclear; however, these findings suggest that the amount of rumination alone is not a significant factor in the development of PTG. It is possible that rumination's impact as a resource lies in its content, not its amount. A focus for future work is the nature and type of cognition occurring following trauma and the processes involved in children's adaptation.

In contrast with prior research with adolescents (e.g., Milam et al., 2004), age did not relate to most of the measures used to explore the hypothesized model. The positive correlation of age with social support may suggest that, as children age, their social networks expand and they are able to access support from more sources, including extrafamilial peer and adult relationships. The finding may also reflect children's age-related developmental changes as they engaged study measures—that is, the tasks for the ISS-C Part 2 required higher level fine motor skills and cognitive capacities than the other scales. Further exploration of the effects of age and development on PTG is needed.

Unlike several published studies (Park, Cohen, & Murch, 1996; Tedeschi & Calhoun, 1996), children's reports of the trauma's severity were not related to PTG nor to the other assessed constructs. Even though participant children all experienced Hurricane Floyd and its flooding and were among those referred to an intervention for those "severely impacted" by the disaster, they reported considerable variation in their perceptions of the event, and their severity ratings were relatively evenly distributed across the scale. It appears that the events experienced by this child sample achieved a threshold for disruption or trauma sufficient to yield PTG; however, the relationship between the nature and level of the trauma and PTG in children is unclear, and future research appears warranted.

Study findings are limited in that the sample was small and the measures were new. The sample's restricted, voluntary nature further limits generalizability. Instead of relying on cross-sectional data, administering measures immediately after the Hurricane Floyd flooding and again several months later, along with additional measures of stress exposure, individual characteristics, familial factors, and adjustment, would have yielded a clearer picture of the children's adaptation and the processes involved. The present findings identify variables that might be incorporated fruitfully into designs in which inference of causality is possible; however, such inference is not possible here.

Notwithstanding such issues, these data extend prior PTG findings, based almost exclusively on adults, to children and provide support for the process that is generally consistent with the hypothesized model. Researchers need to develop further the nomological network of variables associated with PTG in children to better understand the phenomenon. Studying PTG among those experiencing other traumas, assessing family and contextual factors, and including measures of such constructs as realistic control (Wannon, 1990), future expectations (Wyman et al., 1993), self-efficacy (Cowen et al., 1991), and perceived competence (Harter, 1985) will enhance knowledge of the process in children, elucidating similarities and differences between them and adults.

Previous investigations have documented the sequelae of natural disasters and tested conceptual models of children's reactions to disasters and the emergence of posttraumatic stress disorder (PTSD; e.g., Vernberg, La Greca, Silverman, & Prinstein, 1996).

In fact, Russoniello et al. (2002) detailed symptomatology of children directly affected by Hurricane Floyd, the disaster experienced by the present sample. In that study, 6 months after the hurricane, 95% of the children experienced at least mild PTSD symptoms, 71% exhibited moderate to severe symptoms, and those whose homes were flooded were three times more likely to report symptoms. Although it is important to understand the negative impact of such events, acknowledging the possibility of growth and the potential for positive change can also carry considerable weight.

Indeed, perhaps reflecting a growing recognition of the insufficiency of mental health's traditional deficit focus or medical model orientation (see Cowen, 1994; Cowen & Kilmer, 2002; Seligman & Csikszentmihalyi, 2000), researchers have gone beyond the negative consequences of such experiences and increasingly have addressed the variability in children's responses to stress and trauma—that is, some cope and adapt well despite exposure to significant adversity. This notion has led to burgeoning interest in resilience, and, although the PTG research base among non-adults is less well developed, working to understand the PTG process accords well with recent charges to focus on what "goes right" in development, emphasize positive outcomes, and study strength, virtue, and growth (Cowen, 1994; Seligman & Csikszentmihalyi, 2000).

Beyond the heuristic benefit of such work, research supporting the PTG process among young people can provide valuable information for clinicians working with children who have experienced trauma, perhaps guiding aspects of their assessments and interventions. Suggesting that PTG is possible and identifying factors or conditions associated with PTG among children will assist clinicians in (a) attending to and assessing positive factors and (b) pursuing means to facilitate their development or enhancement and foster PTG (see Tedeschi & Kilmer, 2005). Helping youngsters cope effectively, make meaning of their experiences, and even grow in the aftermath of trauma is consistent with many of the competence-enhancement and skill-building approaches increasingly used clinically (e.g., Paton, Violanti, & Smith, 2003). Future work may suggest ways to facilitate children's association of positive beliefs with negative events and ways that particular types of support can contribute to the well-being of children faced with traumatic stressors. Highly stressful events can produce painful and sometimes long-lasting difficulties for those experiencing them. These findings suggest that, as a result of struggling with difficult and traumatic circumstances, some children may experience, perhaps concomitantly with distress, significant growth.

References

- Cadell, S., Regehr, C., & Hemsworth, D. (2003). Factors contributing to posttraumatic growth: A proposed structural equation model. *American Journal of Orthopsychiatry*, 73, 279–287.
- Calhoun, L. G., Cann, A., Tedeschi, R. G., & McMillan, J. (2000). A correlational test of the relationship between posttraumatic growth, religion, and cognitive processing. *Journal of Traumatic Stress*, 13, 521–527.
- Calhoun, L. G., & Tedeschi, R. G. (1998). Posttraumatic growth: Future directions. In R. G. Tedeschi, C. L. Park, & L. G. Calhoun (Eds.), *Posttraumatic growth: Positive change in the aftermath of crisis* (pp. 215–238). Mahwah, NJ: Erlbaum.

- Calhoun, L. G., & Tedeschi, R. G. (1999). *Facilitating posttraumatic growth: A clinician's guide*. Mahwah, NJ: Erlbaum.
- Calhoun, L. G., & Tedeschi, R. G. (2004). The foundations of posttraumatic growth: New considerations. *Psychological Inquiry, 15*, 93–102.
- Cowen, E. L. (1994). The enhancement of psychological wellness: Challenges and opportunities. *American Journal of Community Psychology, 22*, 149–179.
- Cowen, E. L., & Kilmer, R. P. (2002). "Positive Psychology": Some plusses and some open issues. *Journal of Community Psychology, 30*, 449–460.
- Cowen, E. L., Work, W. C., Hightower, A. D., Wyman, P. A., Parker, G. R., & Lotyczewski, B. S. (1991). Toward the development of a measure of perceived self-efficacy in children. *Journal of Clinical Child Psychology, 20*, 169–178.
- Donaldson, D., Prinstein, M. J., Danovsky, M., & Spirito, A. (2000). Patterns of children's coping with life stress: Implications for clinicians. *American Journal of Orthopsychiatry, 70*, 351–359.
- Grant, K. E., Compas, B. E., Stuhlmacher, A. F., Thurm, A. E., McMahon, S. D., & Halpert, J. A. (2003). Stressors and child and adolescent psychopathology: Moving from markers to mechanisms of risk. *Psychological Bulletin, 129*, 447–466.
- Harter, S. (1985). *Manual for the Self-Perception Profile for Children*. Denver, CO: University of Denver.
- Hasan, N., & Power, T. G. (2004). Children's appraisal of major life events. *American Journal of Orthopsychiatry, 74*, 26–32.
- Hogan, N. S., & Schmidt, L. A. (2002). Testing the grief to personal growth model using structural equation modeling. *Death Studies, 26*, 615–634.
- Horowitz, L. A., Loos, M. E., & Putnam, F. W. (1997, November). "Perceived benefits" of traumatic experiences in adolescent girls. Paper presented at the 13th Annual Meeting of the International Society for Traumatic Stress Studies, Montreal, Quebec, Canada.
- Luthar, S. S. (Ed.). (2003). *Resilience and vulnerability: Adaptation in the context of childhood adversities*. New York: Cambridge University Press.
- Luthar, S. S., Cicchetti, D., & Becker, B. (2000). The construct of resilience: A critical evaluation and guidelines for future work. *Child Development, 71*, 543–562.
- Martin, L. L., & Tesser, A. (1996). Clarifying our thoughts. In R. S. Wyer (Ed.), *Ruminative thought: Advances in social cognition* (Vol. 9, pp. 189–209). Mahwah, NJ: Erlbaum.
- Masten, A. S. (2001). Ordinary magic: Resilience processes in development. *American Psychologist, 56*, 227–238.
- Masten, A. S., & Coatsworth, J. D. (1998). The development of competence in favorable and unfavorable environments. *American Psychologist, 53*, 205–220.
- Milam, J. E., Ritt-Olson, & Unger, J. (2004). Posttraumatic growth among adolescents. *Journal of Adolescent Research, 19*, 192–204.
- Osofsky, J. D. (Ed.). (2004). *Young children and trauma: Intervention and treatment*. New York: Guilford Press.
- Park, C. L. (1998). *Implications of posttraumatic growth for individuals*. In R. G. Tedeschi, C. L. Park, & L. G. Calhoun (Eds.), *Posttraumatic growth: Positive changes in the aftermath of crisis* (pp. 153–177). Mahwah, NJ: Erlbaum.
- Park, C. L., Cohen, L. H., & Murch, R. L. (1996). Assessment and prediction of stress-related growth. *Journal of Personality, 64*, 72–105.
- Paton, D., Violanti, J. M., & Smith, L. M. (Eds.). (2003). *Promoting capabilities to manage posttraumatic stress*. Springfield, IL: Charles C. Thomas.
- Russoniello, C. V., Skalko, T. K., O'Brien, K., McGhee, S. A., Bingham-Alexander, D., & Beatley, J. (2002). Childhood posttraumatic stress disorder and efforts to cope after Hurricane Floyd. *Behavioral Medicine, 28*, 61–70.
- Seligman, M. E. P., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychologist, 55*, 5–14.
- Tedeschi, R. G., & Calhoun, L. G. (1995). *Trauma and transformation: Growing in the aftermath of suffering*. Thousand Oaks, CA: Sage.
- Tedeschi, R. G., & Calhoun, L. G. (1996). The Posttraumatic Growth Inventory: Measuring the positive legacy of trauma. *Journal of Traumatic Stress, 9*, 455–471.
- Tedeschi, R. G., & Calhoun, L. G. (2004). Posttraumatic growth: Conceptual foundations and empirical evidence. *Psychological Inquiry, 15*, 1–18.
- Tedeschi, R. G., & Kilmer, R. P. (2005). Assessing strengths, resilience, and growth to guide clinical interventions. *Professional Psychology: Research and Practice, 36*, 230–237.
- Vernberg, E. M., La Greca, A. M., Silverman, W. K., & Prinstein, M. J. (1996). Prediction of posttraumatic stress symptoms in children after Hurricane Andrew. *Journal of Abnormal Psychology, 105*, 237–248.
- Wannon, M. (1990). *Children's control beliefs about controllable and uncontrollable events: Their relationship to stress resilience and psychosocial adjustment*. Unpublished doctoral dissertation, University of Rochester.
- Werner, E. E., & Smith, R. S. (1982). *Vulnerable but invincible: A study of resilient children*. New York: McGraw-Hill.
- Weyer, M., & Sandler, I. N. (1998). Stress and coping as predictors of children's divorce-related ruminations. *Journal of Clinical Child Psychology, 27*, 78–86.
- Wyman, P. A., Cowen, E. L., Work, W. C., & Kerley, J. H. (1993). The role of children's future expectations in self-system functioning and adjustment to life stress: A prospective study of urban at-risk children. *Development and Psychopathology, 5*, 649–661.

Received March 24, 2004

Revision received October 15, 2004

Accepted November 15, 2004 ■