

Review of Coping in Children Exposed to Mass Trauma: Measurement Tools, Coping Styles, and Clinical Implications

Betty Pfefferbaum, MD, JD;¹ Pascal Nitiéma, MD, MPH, MS;¹ Anne K. Jacobs, PhD;¹
Mary A. Noffsinger, PhD;^{1,2} Leslie H. Wind, PhD;³ Sandra F. Allen, PhD¹

1. Terrorism and Disaster Center, Department of Psychiatry and Behavioral Sciences, College of Medicine, University of Oklahoma Health Sciences Center, Oklahoma City, Oklahoma USA
2. Courtroom Sciences, Inc., Irving, Texas, USA
3. School of Social Work, Orange County Academic Center, University of Southern California, Irvine, California USA

Correspondence:

Betty Pfefferbaum, MD, JD
Department of Psychiatry and Behavioral Sciences
College of Medicine
University of Oklahoma Health Sciences Center
P.O. Box 26901, WP 3417
Oklahoma City, Oklahoma
USA 73126-0901
E-mail: betty-pfefferbaum@ouhsc.edu

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Abstract: Evidence-based practice requires the use of data grounded in theory with clear conceptualization and reliable and valid measurement. Unfortunately, developing a knowledge base regarding children's coping in the context of disasters, terrorism, and war has been hampered by a lack of theoretical consensus and a virtual absence of rigorous test construction, implementation, and evaluation. This report presents a comprehensive review of measurement tools assessing child and adolescent coping in the aftermath of mass trauma, with a particular emphasis on coping dimensions identified through factor analytic procedures. Coping measurement and issues related to the assessment of coping are reviewed. Concepts important in instrument development and psychometric features of coping measures used in disasters, terrorism, and war are presented. The relationships between coping dimensions and both youth characteristics and clinical outcomes also are presented. A discussion of the reviewed findings highlights the difficulty clinicians may experience when trying to integrate the inconsistencies in coping dimensions across studies. Incorporating the need for multiple informants and the difference between general and context-specific coping measures suggests the importance of a multilevel, theoretical conceptualization of coping and thus, the use of more advanced statistical measures. Attention also is given to issues deemed important for further exploration in child disaster coping research.

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Introduction

Because of the relationship between stressful experiences and health and mental health outcomes, multiple disciplines (eg, medicine, mental health, and public health) incorporate coping as a critical construct related to theory, assessment, and intervention when planning for, and responding to, the adverse circumstances associated with mass trauma. Evidence-based practice requires rigorous research that relies on clear conceptualization and measurement of key constructs of interest. Unfortunately, the conceptualization and measurement of coping in children and adolescents has been challenging both in general and within specific contexts. The current report selected coping instruments that have been utilized by researchers and clinicians in the context of disasters, terrorism, war, or other mass-casualty events or situations to form the basis of a review of studies assessing coping in children and adolescents affected by mass trauma. This review addresses coping in relation to child characteristics, event exposure, and clinical implications. Given the need to establish and improve the measurement of children's coping in the context of mass trauma,

Abbreviations:

CCSC: Children's Coping Strategies Checklist
CFA: confirmatory factor analysis
EFA: exploratory factor analysis
HICUPS: How I Coped Under Pressure Scale
PCA: principal component analysis
PTS: posttraumatic stress
PTSD: posttraumatic stress disorder

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recommendations are offered for the further development of instrumentation that reflects the complexity of coping within these contexts. Clinical implications regarding the current literature base using these measures are also considered.

Search Methodology and Results

A systematic search for publications assessing coping in children in the context of disasters, terrorism, war, and mass trauma was conducted in the fall of 2014. The review included studies published in refereed journals with an identifiable measure of coping that addressed children and/or adolescents affected by mass trauma. Search terms were chosen with the intent of identifying publications related to: (1) coping with collective trauma, disasters, mass trauma, terrorism, terrorist events, and/or war in children and/or adolescents; and (2) coping assessments, instruments, measures, scales, and/or tools used with children and/or adolescents. The following databases were searched: EBM Reviews (Ovid Technologies; New York, New York USA); EMBASE (Elsevier; Amsterdam, Netherlands); ERIC (EBSCO Information Services; Ipswich, Massachusetts USA); Medline (Medline Industries, Inc; Mundelein, Illinois USA); Ovid (Ovid Technologies; New York, New York USA); PILOTS (National Center for PTSD, US Department of Veteran Affairs; Washington, DC USA); PsycINFO (American Psychological Association; Washington DC, USA); and Social Work Abstracts (EBSCO Information Services; Ipswich, Massachusetts USA). The search was confined to materials on children and adolescents, aged 0 to 18 years, and to English language sources with no restriction on date of publication. The search yielded a total of 1,330 unduplicated titles. An updated search in the spring of 2015 yielded an additional 420 unduplicated titles. Throughout the process, titles, abstracts, and reference sections of publications were reviewed to identify additional materials that were not generated in the database searches. From the two searches, 228 publications specifically addressing coping in children and adolescents in the context of mass trauma were identified for more careful examination.

Criteria for inclusion in this review required the study instrument used to assess coping to have been subjected to factor analytic methods with the study sample. Restricting the selected publications to those that had performed principal component analysis (PCA), exploratory factor analysis (EFA), or confirmatory factor analysis (CFA) confined the current review to coping instruments that have demonstrated content validity. A total of 20 studies investigating 14 coping instruments and including factor or principal component analytic procedures were identified for this analysis. The studies which met the selection criteria and were included in this review are presented in Table 1.¹⁻³⁰

Dimensions of Coping

Coping can be volitional and goal directed, or it can be involuntary. Voluntary coping includes a host of intentional activities, including efforts to mobilize social support. Involuntary responses to stress include temperamentally-based and conditioned reactions that may or may not be within the individual's conscious awareness and are not under volitional control, such as emotional and physiological arousal, intrusive thoughts and rumination, and emotional numbing.²⁰ To date, there does not appear to be a uniform theory regarding the dimensions of child and adolescent coping. Moreover, the terminology to depict various elements of coping is inconsistent. Several dimensional categories have been used to describe coping styles in children and adolescents—problem-focused and

emotion-focused coping, primary and secondary control coping (sometimes called assimilative and accommodative coping), and engagement and disengagement coping (also referred to as approach versus avoidant coping),³¹ most of which are considered voluntary coping efforts. Problem-focused coping refers to voluntary activities such as seeking information or attempting to change the circumstances in some way. Examples of emotion-focused coping include expressing emotions, seeking support, and avoiding anything related to the event. Primary control, or assimilative coping, is used by children to increase their sense of personal control either by changing events or by regulating their own emotions.³¹ Secondary control, or accommodative coping, is focused on adaptation through means such as acceptance or cognitive restructuring. Engagement coping entails problem solving or seeking support while disengagement, or passive coping, focuses away from the event or one's reactions to it, through actions like withdrawal or denial.³¹

Reflecting the child coping literature in general, the studies examined for this report were also inconsistent in describing coping dimensions. A number of studies categorized coping dimensions as problem-focused and emotion-focused,^{12,26,32} as primary and secondary control,²⁰ as engagement and disengagement,²⁰ or as active and passive coping.^{13,24} Active, avoidant, and support (or support seeking) coping^{5,15,33} and distraction^{15,33} were commonly referenced categories. Other studies simply referred to adaptive and maladaptive coping⁶ and productive and non-productive coping.³

Development and Psychometric Features of Coping Measures

Existing coping measures reflect a variety of theoretical and practical considerations. Recently, researchers have begun to incorporate sophisticated statistical procedures for optimal development and evaluation of coping instruments. A brief review of factor analytic approaches and their importance for the future of coping assessment is presented as a foundation to discussion of factor analytic findings of the coping construct in the literature reviewed.

Factor Analytic Methods for Instrument Validation

Although a theoretical framework defining the dimensions of a construct is essential in designing a tool to measure that construct, the postulated theory must be confirmed by data from the field. Indeed, a hypothesized model may not be supported by empirical data. In the specific case of coping, the construct may be influenced by age, gender, and/or culture, but with no universal model and requiring that researchers test the adequacy of the construct dimensions in each study population. Factor analytic techniques yield estimates of how well operationalized aspects of coping are represented within a measure and determine the adequacy of fit of previously-identified factor structures. Factor analysis is considered an excellent statistical procedure for demonstrating content validity of an instrument.³⁴

Three analytic methods have been utilized to identify or confirm the dimensions of coping as a construct: PCA, EFA, and CFA. Principal component analysis is a data reduction technique for a dataset with highly correlated variables that creates linear combinations of weighted observed variables to obtain uncorrelated variables known as principal components. Principal component analysis does not actually identify latent (unobserved) variables (eg, coping, resilience, or functioning), but instead combines the correlated items to form a set of uncorrelated

variables that can be used to summarize the data. Principal component analysis accounts for the total variance of the variables being analyzed, that is, the variance that is unique to each variable as well as the variance common among those variables.

Exploratory factor analysis takes into account only the variance that is common among all of the variables. Exploratory factor analysis identifies latent variables or common factors, which cannot be measured directly, from a set of observed variables. This difference between PCA and EFA has led some authors to recommend the use of EFA instead of PCA for identifying latent constructs and the dimensions of a measurement tool.^{35,36} In EFA, factors are assumed to be the underlying roots, or origin, of the measured variables, and these factors can be used to define subscales of the instrument. Principal component analysis may yield principal components that are similar to the factors obtained through an EFA, but the results of PCA and EFA may diverge when communalities are low or when the ratio number of observed variables by the number of factors is small.³⁶ As an exploratory method, EFA does not constrain the observed variables to load to a specific underlying construct.

As its name suggests, CFA, which is not a data reduction method, determines whether prior knowledge or theory about the relationship between latent constructs and observed variables is confirmed with the data collected from the study sample. In CFA, the observed variables are loaded into pre-defined latent constructs. The model's fit is then evaluated with a good fit confirming the tested theory or knowledge. If the theory is not confirmed with the available data, the researcher may then choose to conduct an EFA to identify latent constructs.

Replicability of Factor Analytic Methods

As noted by Skinner and colleagues,³⁷ EFA conducted on data from different samples may not yield the same coping constructs, raising the issue of replicability of the reported coping dimensions. Early in the process of instrument development, researchers should ensure reliability and replicability of their findings. For this purpose, EFA should be conducted with a sample size large enough to minimize the standard errors of the parameter estimates and to obtain reliable results. Elements that should be considered to determine the adequate sample size include the communalities of the variables (ie, the proportion of variation of variables that is explained by the common factors) and the ratio of the number of questionnaire items to the number of factors.³⁸ Replicability of the extracted factors can be determined either with a fraction of the same study sample (internal replicability) or with data collected on a different sample (external replicability).³⁹ When conducting an internal replicability analysis, the study sample used for the EFA is divided into subsamples with one subsample used to identify the coping constructs and the remaining to determine whether identical factors are extracted.

Assessment of Measurement Invariance

Another important concern is whether an instrument can provide valid measures across different populations. Measurement invariance assessment is a technique used in CFA (and structural equation modeling) to determine whether respondents with the same true instrument scores will have the same observed scores regardless of their membership in a specific group (eg, gender, ethnicity, or culture).^{40,41} This ensures that a given measurement will yield valid scores if used in different populations and that observed between-group differences in scores are not artifacts of

inconsistencies in the performance of the instrument when used in different populations. Strict measurement invariance as recommended by Meredith⁴⁰ requires not only that the same factor structure holds across groups, but also that the factor loadings, intercepts, and residual variances of the multi-group CFA be equal across these groups.

Results of Factor Analyses of Children's Coping in the Context of Mass Trauma

The coping mechanisms used by children and adolescents exposed to mass trauma have been explored using factor analytic techniques. This exploration assumes that some unobserved, underlying factors stimulate the coping strategies reported by the respondents (EFA), or that the reported strategies that are correlated can be combined to form a set of uncorrelated variables (PCA). Among the 20 studies selected for this review, six conducted EFA and seven conducted PCA of the coping measurement tool using data collected from the study participants. The number of identified coping dimensions varied from two to nine, with a three-factor solution being the most frequent ($n = 5$). Ten (50.0%) of the studies reviewed for this report used CFA to verify the coping dimensions identified by specific measurement tools in previous studies. Nine of these ten studies confirmed in their sample the dimensions formerly identified by other studies using the instrument (Table 1).

Significant variability exists across instruments and studies in the number and content of the identified coping factors, and varying factors may emerge when the same measure is used with different populations. Few studies have identified a clear theoretical framework to guide instrument construction or to test the instrument across multiple populations with various forms of exposure to diverse types of mass trauma. Significant age differences have emerged in factor structures which are likely representative of developmental differences in coping.¹⁷ None of the studies reviewed has conducted a multi-group confirmatory factor analysis to evaluate factorial invariance of the coping instrument across sample subgroups (eg, age, gender, or ethnicity).

Coping Styles and Respondent Characteristics and Event Exposure

The reviewed studies revealed relationships between coping styles used by children and adolescents and age and/or development, gender, culture, and aspects of exposure to the traumatic event. Restricting the analysis to studies that conducted factor analysis of coping data collected from various study samples ensured that the coping dimensions or styles examined in the investigation were actually those used by the study participants.

Age and Developmental Stage

The choice of coping strategy used by children may differ according to their age or developmental level.⁴² While the number of studies is limited, extant research supports an increase in cognitive coping strategies with age^{21,25,27} as cognitive functions mature. Baráth²⁴ found that cognitive development influenced coping more than gender, with younger children more likely to use passive, self-focused coping strategies such as crying or staying alone. Earlier research conducted by Boehnke and colleagues¹³ found that passive strategies, which are used in situations in which the individual has no options for action or active coping, decreased with age, while seeking factual information increased with age. Weisenberg and colleagues²⁶ concluded that adolescents used

more effective emotion-based techniques than younger children. Punamäki and Puhakka²⁷ reported that older children (12 to 13 years of age) had a broader range of coping techniques than younger children (10 to 11 years of age), and that older children used both more emotional and cognitive coping strategies. Hoffner and Haefner²⁵ also found an increase in the use of cognitive coping with age in a sample of 80 American children (ages eight to 12 years) exposed to the televised news coverage of the 1991 Persian Gulf War. Younger children relied more on social support for coping than their older counterparts, but the trend was not statistically significant.²⁵ In a sample of 185 Palestinian children assessed before and during the 1987-1991 Intifada, Punamäki and Puhakka²⁷ observed that the use of cognitive coping processes (including intellectualization, wishful and magical thinking, denial of emotions, and verbal hostility toward Israeli soldiers) as well as avoidant distraction (including passivity and helplessness, distraction, and feeling overwhelmed by stress) increased with age.

Age also may influence how caregivers respond to children's coping needs. Following Hurricane Andrew (Florida, USA; 1992), third graders reported receiving more emotional processing help than did the fourth and fifth graders.⁸ Gender differences also may play a role in these developmental differences. In a cross-sectional study of political violence, older girls were more likely to report coping through active fighting compared to younger girls, while the opposite trend was found for boys.²⁷

Gender

While not all studies found gender differences in children's use of active, avoidant, and/or emotion-focused coping strategies,^{11,18,24} some studies revealed an association between the coping strategies used by youth based upon gender. For example, relative to boys, girls showed a greater use of active coping, such as community and social engagement,²¹ and more primary control strategies, such as problem-solving and emotional regulation.^{22,27} In contrast, boys reported using more non-productive, avoidant strategies,³ and less-active coping techniques.^{13,27} The finding that boys used more non-productive coping than girls may be explained partially by societal expectations of gender roles with boys expected to show more strength and resilience than girls. This expectation may condition boys to refrain from seeking social support.³ In a sample of Israeli children exposed to threat of Scud missile bombardment during the first Persian Gulf War, Weisenberg and colleagues²⁶ found that girls had sought reassurance more than boys. Moreover, societal expectations may lead parents to provide less psychosocial support to boys than to girls after a traumatic experience. As an illustration, in a sample of children previously exposed to Hurricane Andrew, girls reported more social support received from their parents than boys.¹⁸

Culture

There are cross-cultural differences in the coping mechanisms used by children. For example, in a study exploring how children from different cultures might react to difficult situations, Cole, Bruschi, and Tamang³² observed that children in the United States used more problem-focused strategies than Tamang and Brahman children in Nepal, while Tamang and Brahman children used more emotion-focused coping than their US counterparts.

It should be emphasized that with the exception of Wadsworth and colleagues,²¹ none of the studies included in this review assessed measurement invariance of the instrument used to

measure coping. Wadsworth and colleagues²¹ found the Responses to Stress Questionnaire to adequately measure coping in adolescents and young adults. Hence, it is unclear whether the observed associations of specific coping dimensions with age, gender, and culture are real or reflect inconsistencies in the performance of the measurement scales across subgroups within samples.

Event Exposure

There appears to be a dose-response relationship between the intensity of the stressor and coping as measured by a coping questionnaire. For example, Punamäki and Puhakka²⁷ found the coping styles of a sample of Palestinian children to differ with intensity of political violence—greater intensity of exposure was associated with more problem restructuring and less fighting or hostile confrontation. Greater political violence stress among Israeli adolescents exposed to terror attacks was associated with use of more problem-focused, emotion-focused, and avoidant coping.¹⁰

The type of exposure to the traumatic event also may be associated with the coping style used. For instance, Tatar and Amram³ reported a positive correlation between the use of productive coping and being at the site of a terrorist attack without being injured and a negative correlation between use of these strategies and greater contact with media reports covering terrorism. Of course, the interaction of participant characteristics can result in a more complex picture of coping. Moscardino and colleagues⁵ found that the use of active coping and avoidant coping by adolescents who survived the 2004 Beslan terrorist attack differed according to their gender, and to whether they had been taken hostage during the attack (direct exposure) or were present at the site of the attack but not taken hostage (indirect exposure). Boys who were exposed directly to the attack used active coping more than directly exposed girls, whereas indirectly exposed boys used active coping less than indirectly exposed girls.⁵ Hoffner and Haefner²⁵ investigated the coping mechanisms of children who watched televised news coverage of the first Persian Gulf War and found children used cognitive coping more than social support.

Clinical Outcomes and Coping

Assessing coping is of interest to clinicians in how these strategies relate to impaired functioning, adaptation, and resilience. Unfortunately, the variability and complexity of coping styles without consideration of an overarching theoretical framework makes it challenging for practitioners to discern how best to use information on coping to develop, deliver, and modify interventions for youth after a mass-trauma event. To determine the effectiveness of coping strategies, some studies have assessed the relationship between coping methods and clinical outcomes identifying certain coping strategies as associated with positive/adaptive outcomes. In general, adaptive coping strategies (eg, active coping) are less frequently associated with distress symptoms compared to strategies targeting emotional distress reactions (eg, emotion-focused coping). For instance, in a sample of Israeli adolescents exposed to terror attacks, Zeidner¹⁰ reported an association of emotion-focused coping with negative mood, posttraumatic stress (PTS) reactions, and somatic symptoms; avoidant coping was associated with negative mood and somatic symptoms; and problem-focused coping was associated with none of these distress symptoms. Problem restructuring and behavioral coping strategies also were associated with fewer psychosocial

difficulties in Palestinian children exposed to the First Intifada.²⁷ Following Hurricane Andrew, more severe levels of posttraumatic stress disorder (PTSD) symptoms in grade school children positively correlated with more emotional processing, greater distraction coping, and less adult support of rules and routines.⁸ West German adolescents facing nuclear threat who used a defensive style of coping tended to report more personal anxieties.¹³

Despite a growing research base promoting active coping strategies and cautioning against the use of emotion-focused or avoidant coping, other studies reflect the need for a more sophisticated understanding of coping dimensions. In response to Scud missile attacks, children later assessed with PTSD tended to use more checking behaviors and requests for reassurance while utilizing less verbal distraction.²⁶ Surprisingly, greater use of problem-focused coping and less emotion-focused coping also were associated with more severe postwar stress reactions, perhaps because it is not effective to use problem-focused strategies in situations that cannot be changed.²⁶ In a sample of African-American children exposed to Hurricane Katrina (Louisiana USA; 2005), internalized negative coping was associated with greater depression, anxiety, and social stress; however, problem-avoidant coping was not associated with any of the assessed negative outcomes.¹⁷ Schiff¹² found that both emotion-focused and problem-solving coping were related to higher PTSD symptoms and speculated that perhaps problem-solving coping was not as helpful when teens faced an ongoing terror threat. Similar results were reported by Stratta and colleagues⁷ who found a positive association between emotional coping and PTSD symptoms in a sample of adolescents exposed to the 2009 earthquake in L'Aquila (Italy). Schiff¹² also noted that religiosity buffered terrorism exposure, underscoring the importance of context when addressing coping.

Gender may also need to be considered when evaluating the effectiveness of coping skills. Wadsworth and colleagues²¹ found that girls used more emotion-focused coping, which was related to better functioning for them while boys used more disengagement, which was linked to worse functioning only in girls. Moscardino and colleagues⁵ highlighted the need to consider both gender and exposure when examining outcomes in youth 18 months following a hostage crisis. For directly exposed adolescents, avoidant coping was linked to worse psychological outcomes for both genders, but this relationship was found only for girls among indirectly exposed students who usually attended the school but were not present or taken hostage on the day of the attack. The effectiveness of coping styles in alleviating psychosocial problems also varied according to the intensity of political violence. Problem restructuring, active fighting, and behavioral coping were linked to fewer psychosocial difficulties during, but not before, the First Intifada.²⁷

Clinicians must remember that these statistical relationships merely are associations without directionality. Also, most of the studies on coping strategies and PTS outcomes are cross-sectional, with no evidence of the temporal sequence among the disaster-related symptoms. Vernberg and colleagues¹⁸ found all four coping variables analyzed (positive coping, blame-anger, wishful thinking, and social withdrawal) after Hurricane Andrew were related to PTSD symptoms leading the authors to argue that a high level of distress may result in children using a greater variety of coping strategies. Moreover, the extent to which items used to measure coping styles are the same as, or similar to, those measuring emotional outcomes (eg, avoidant coping versus avoidance subscale of a PTS symptoms scale) may influence results

demonstrating correlations between some coping factors and outcomes. Hence, it is possible that some observed associations between coping strategies and disaster-related symptoms just indicate correlations among similar or close constructs.

Considerations for the Assessment of Disaster Coping

The literature has raised both theoretical and practical issues related to coping in children in the context of mass trauma. These considerations center on identifying appropriate informants and the appropriate content to query.

Self-report Measures and Other Informants

Self-report screening measures are valued for their relatively quick and direct administration, making them especially useful in the acute aftermath of a mass-trauma event when rapid decision making regarding limited resources is needed.⁴³ Children can provide accurate indications of their internal states⁴⁴ and are the most direct and objective source of subjective information (eg, symptoms and coping efforts) following exposure to mass trauma.⁴⁵ Vernberg and colleagues¹⁸ suggested that parents and teachers, likely struggling with their own stress due to an event, may be less reliable than children themselves in reporting their children's distress. Yule and Williams⁴⁶ elaborated further noting that children exposed to trauma did not always share their concerns with their parents to protect the parents from additional distress. Thus, certain response biases may interfere with an accurate appraisal of child coping. Children may distort their responses intentionally or unintentionally. For example, in an effort to present themselves in the best possible light, children may not acknowledge the use of ineffective or socially undesirable coping strategies (eg, denial and wishful thinking).³¹ Also, self-reports that are retrospective in nature may be biased by poor recall and by some degree of natural resolution of event-related problems.³¹

Most researchers agree on the importance of gathering data from multiple sources to obtain the most comprehensive appraisal of children's reactions and functioning.^{43,47-49} Research indicates that although the most accurate information about children's personal experiences, perceptions, and internal emotions is provided by the children themselves, parents best report children's external behaviors and teachers are adept at identifying variations among peers.⁴⁹ In spite of efforts to utilize brief instrumentation, gathering information from multiple informants using multiple methods in a community grappling with the devastating effects of mass trauma presents tremendous challenges. It is this information that practitioners need to build understanding and intervene effectively.

General and Context-specific Coping Measures

Coping measures can be categorized broadly as either general or context-specific. General coping measures (eg, Adolescent Coping Orientation for Problem Experiences [A-COPE]) assess children's coping styles across stressors, whereas some measures (eg, How I Coped Under Pressure Scale [HICUPS]) instruct participants to rate items according to their reactions to a specific stressor. Some general measures have been adapted to assess situation-specific coping.¹⁴ Investigations of general coping styles typically include broad outcome measures of overall adjustment and do not consider the process of coping within a discrete stressful situation or event.¹⁴ As Compas and colleagues³¹ noted, in inquiries of general coping as compared with a specific or unspecified situation, the use of a self-selected stressor undermines

the validity of the measurement. Perhaps the most common method of assessing coping, asking children to report on their coping “in general,” ignores potentially important contextual factors.³¹ Lazarus and Folkman⁵⁰ emphasized coping in response to specific stressors and asserted that general, or “trait,” measures of coping oversimplify the coping process and are of limited value in explaining and predicting one’s actions in a specific context. Thus, measures that address situation-specific coping are likely to be more appropriate in predicting outcomes directly associated with a mass-trauma event because they are grounded in transactional theory which views the person and the environment in a “dynamic, mutually reciprocal, bidirectional relationship.”^{50(p293)}

To address general and specific approaches to the assessment of coping, Ayers and colleagues¹⁴ developed a situation-specific coping instrument, HICUPS, to complement their measure of general coping style, the Children’s Coping Strategies Checklist (CCSC).⁵¹ Simultaneous use of the CCSC and HICUPS allows for a direct examination of the suitability of a general (ie, trait) or context-specific (ie, state) version among young disaster victims. One child disaster study evaluated the use of both general and context-specific forms of the measure.⁵² Lengua and colleagues⁵² did not use both the CCSC and HICUPS, but revised the instructions on the CCSC to assess coping specific to the September 11th attacks (New York USA; 2001) to obtain information about children’s “dispositional” and “situational” coping strategies. Using prospective data on pre-attack stress load, appraisal, and coping responses, these researchers found that children’s pre-event dispositional coping and their event-specific situational coping both affected their September 11th PTS symptoms.⁵² Dispositional coping directly influenced the initiation of situation-specific coping strategies and the development of positive or negative stress outcomes. Despite the recommendation to include both specific and global measures of coping,⁵³ researchers have continued to utilize inquiries of coping in response to unspecified stressors. It is hopeful that a trend toward using measures of situational coping is emerging, as many of the studies reviewed in this report investigated context-specific coping rather than general coping.

Implications for and Challenges in Clinical Application

In their review of child and adolescent coping, Compas and colleagues³¹ identified two practical applications of coping research: (1) understanding coping strategies as mediators and moderators between stress and adaptive developmental trajectories; and (2) informing interventions designed to prevent psychopathology by finding ways to enhance effective coping. Skinner and colleagues³⁷ analyzed 100 coping category systems and found little overlap or consistency in categories of coping strategies used. The authors noted that this lack of consensus has impeded research progress; it also delays the practical use of these data in the field.³⁷ The current review revealed the many inconsistent coping dimensions and the difficulty bridging multiple studies. Though the current review examined a much more restricted sample of measures and contexts, a similar breadth of coping constructs emerged.

The inconsistencies in the coping dimensions explored make it difficult to integrate findings across studies in a meaningful way. Two initial challenges exist for professionals in using the coping literature. First, they must try to aggregate findings of studies that use different measures to examine a variety of coping dimensions and strategies. Second, they need to determine if the results are

consistent across different populations of youth and in different contexts. As an illustration, the Kidcope has the advantages of being brief and having been used in previous disaster studies, yet Vigna and colleagues¹⁷ found that the proposed factor structure for the Kidcope did not fit the data they collected from hurricane-exposed, low-income, African American adolescents. These investigators also failed to find a relationship between the coping style, measured by the Kidcope, and personal adjustment.¹⁷ The current review revealed some support for promoting active coping strategies to enhance post-disaster functioning,^{10,27} but it also uncovered specific situations in which emotion-focused coping seemed advantageous.^{26,21} For example, in one study, because there was nothing that could be done about the threat of missile attacks on children in sealed rooms, problem solving was associated with more stress;²⁶ in another study, emotion-focused coping was advantageous only for girls, perhaps because girls are likely to seek social contact during times of stress.²¹ As researchers learn more about coping across different populations and contexts, the interpretation is not as simple as promoting active coping and discouraging avoidant strategies.^{5,17} The interactions of many variables in different contexts are complex and require a more holistic interpretation of coping strategies.^{5,17} It is challenging to draw conclusions across these different studies, but these diverse and sometimes seemingly contradictory findings add to the developing, complex landscape that is the current state of knowledge related to coping across diverse dispositions, populations, exposures, and contexts.

While studies on the effectiveness of coping have shown links between better psychological adjustment and particular strategies, the direction of this relationship is not always clear.³¹ This was true for the studies reviewed here. The research currently cannot tell clinicians if a particular coping style leads to a better outcome or, if as Tatar and Amram³ suggest, youth reduce the use of less-productive coping strategies when they feel better. When the use of coping and symptoms are measured concurrently, the direction of the relationship cannot be determined.⁸ Indeed, this measurement situation is common in mass-trauma research where the very things that are needed to advance coping research, such as replicability and experimental design, create challenges for researchers. In assessing the contribution this research makes to the larger body of literature, researchers must be mindful that mass-trauma research often uses an exploratory approach, which while useful, leaves much to be desired.⁵⁴

Conclusions and Future Research Directions

This report provides a comprehensive review of measurement tools that have been used to assess coping in children and adolescents exposed to natural disasters, terrorist attacks, war, and other mass-trauma events. In his guidelines for the assessment of children in disasters, Balaban⁴⁴ identified several features that enhance the usefulness of assessments tools, including: (1) brevity (ie, administered in 60 minutes or less); (2) standardized questionnaire format; (3) ability to be administered by non-clinicians; (4) established for use in disaster or emergency contexts; and (5) accompanied by published psychometric data. While each of these features of instrumentation for assessment is logical within the context of development and mass trauma, it is clear that much work is needed to create reliable and valid measures of coping with mass trauma that incorporate clear, theoretical underpinnings and multidimensional models that include a hierarchy of coping strategies in relation to intention and efficacy over time. Given the

possibility that reported coping dimensions of an instrument may not replicate in another study sample, it is good practice to conduct a CFA testing for the postulated coping dimensions before proceeding with further analyses of the data collected with the coping measurement tool. If the predefined dimensions are not confirmed, researchers may perform an EFA to identify the coping dimensions specific to their study sample while ensuring replicability of their results. Also, the field will benefit from assessing measurement invariance of the coping scales to ensure that these tools are measuring the same constructs equally across different populations.

Using a multilevel, theoretical conceptualization of coping will advance the understanding of coping and the creation of effective assessment tools and interventions used in mass trauma. This conceptualization can help move the field beyond viewing coping as a simplistic, stable individual characteristic that fails to reflect the

child's development, gender, culture, and other key diverse aspects of the process. Braun-Lewensohn's⁵⁵ recent integrated coping model represents movement toward more comprehensive models. Critical to instrument development will be the differentiation of measures needed based on demographic characteristics, exposure, time since the event, and context. Echoing Schwarzer and Schwarzer,⁵⁶ this will require longitudinal assessment using multilevel instruments analyzed with advanced statistical modeling techniques consistent with the complexity of coping. As steps toward developing a more comprehensive conceptualization of coping, the research would benefit from increased attention to individual child factors, such as how temperament or disposition interacts with coping strategies,³¹ and the inclusion of bio-behavioral measures, such as involuntary stress responses.²² Additional factors including social support and the role of cognitive appraisal are also rich areas where more disaster-related research in coping is needed.

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Measure and Description	Characteristics of the Samples Studied	Statistical Technique for Identifying Factors	Factors Studied and Instrument Reliability In Study Sample (Cronbach Alpha)	Assessment of Construct Validity of the Coping Dimensions in the Study Sample
Adolescent Coping Scale ^{1,2} 80-item long form; 18-item short form	Sample of 330 junior and senior high-school students (143 boys; 186 girls), aged 12 to 18 years, living in or near Jerusalem, exposed to terrorist attacks. ³ Studied a measure which included 14 of the 18 original items.	PCA	Two factors of situation-specific coping: Productive coping: $\alpha = 0.84$ Non-productive coping: $\alpha = 0.74$	Not assessed.
Brief COPE ⁴ 28-item self-report Adolescents and Adults	Clinical sample of 71 Russian adolescents assessed 18 months after direct and indirect exposure to school terrorist hostage-taking incident. ⁵	CFA	Confirmed three-factor solution of situation-specific coping: Active coping: $\alpha = 0.78$ Support: $\alpha = 0.81$ Avoidant: $\alpha = 0.71$	Avoidant coping positively correlated with GSI score and Strengths and Difficulties Questionnaire score in both directly and indirectly exposed girls. Support coping positively correlated with GSI score in girls directly exposed to the hostage-taking. Avoidant coping positively correlated with GSI score in boys directly exposed to the hostage-taking.
	Two samples of adolescents exposed to ongoing political violence from the Israeli-Palestinian conflict during the Second Intifada: Palestinian sample: 1,235 students (676 girls; 559 boys) aged 14 to 17 years in grades 9-11. Israeli sample: 1,016 students (519 girls; 486 boys) aged 12 to 18 years in grades 7-12. ⁶	EFA	Two factors of coping: Palestinian sample: Adaptive: $\alpha = 0.78$ Maladaptive: $\alpha = 0.71$ Israeli sample: Adaptive: $\alpha = 0.81$ Maladaptive: $\alpha = 0.77$	Palestinian sample: Significant positive association of PTS with adaptive coping and with maladaptive coping. Israeli sample: Significant positive association of PTS with maladaptive coping but no association with adaptive coping.
	Sample of 371 adolescents aged 17 to 18 years exposed to the earthquake in L'Aquila (Italy) in 2009, assessed 24 months after the earthquake. Administered a short version of COPE (14 items). ⁷	EFA	Three factors of situation-specific coping: Positive coping Emotional coping Disengagement coping Reliability: not specified	Positive coping positively associated with resilience. Emotional coping negatively associated with resilience and positively associated with PTSD symptoms.
Children's Coping Assistance Checklist (CCAC) ⁸ 27-item self-report	Community sample of 506 children in grades 3-5 in Florida (USA) assessed 7 months after geographic exposure to Hurricane Andrew. ⁸	CFA	Confirmed three-factor solution of perceived coping assistance across source (parents, teachers, friends): Emotional processing: $\alpha = 0.74$ Reinstitution of roles and routines: $\alpha = 0.78$ Distraction: $\alpha = 0.84$	Emotional Processing positively correlated with Kidcope Positive Coping and Distraction subscales. Distraction positively correlated with Kidcope Positive Coping and Distraction subscales. Roles and Routines positively correlated with Kidcope Positive coping.
COPE ⁹ 60-item self-report ¹⁰	Community sample of 109 Israeli adolescents living in exposed area during Persian Gulf War completed version of COPE with 2 items from each scale. ¹¹	EFA	Two factors of situation-specific coping: Active coping Palliative coping Reliability: not specified	Palliative coping positively correlated with Anxiety symptoms (State-Anxiety subscale of the State-Trait Personality Inventory); and Physical symptoms (measured with PSSA). Palliative coping negatively correlated with Perceived cognitive functioning (tool devised by authors). Active coping positively correlated with physical symptoms (measured with PSSA).

Measure and Description	Characteristics of the Samples Studied	Statistical Technique for Identifying Factors	Factors Studied and Instrument Reliability In Study Sample (Cronbach Alpha)	Assessment of Construct Validity of the Coping Dimensions in the Study Sample
	Community sample of 227 Israeli adolescents exposed to ongoing terrorist attacks during Al-Aqsa Intifada. ¹⁰	EFA	Three factors of situation-specific coping in Hebrew version: Problem-focused: $\alpha = 0.89$ Emotion-focused: $\alpha = 0.80$ Avoidance: $\alpha = 0.70$	Problem-focused, Emotion-focused, and Avoidance coping positively correlated with Trait Anxiety (Endler's Multidimensional Anxiety Subscale); Political Violence Stress (tool devised by authors); Physical symptoms (measured with PSSA); Post-traumatic reactions (tool devised by authors); and Negative mood (Mood State Questionnaire).
	Community sample of 600 Jewish high school students in Jerusalem assessed 4 years into Al-Aqsa Uprising. ¹²	CFA	Confirmed two-factor solution of dispositional/ trait coping in Hebrew version: Problem-solving coping Emotion-focused coping Reliability: not specified	Problem-solving coping positively associated with PTS measured with the CPTSRI. Emotion-focused coping positively correlated with PTS measured with the CPTSRI and with depressive symptoms.
Coping Styles Scale (CSS) ¹³ 17-item self-report Adolescents	Community sample of 4,039 West German children and adolescents living under nuclear threat. ¹³	CFA	Confirmed two-factor model of situation-specific coping: Active coping Passive defense Reliability: not specified	Active coping positively correlated with Personal Anxiety, Political Anxiety, and Political Engagement. Passive defense negatively correlated with Political Anxiety and Political Engagement and positively correlated with Personal Anxiety.
How I Coped Under Pressure Scale (HICUPS) ¹⁴	Sample of 4,564 New York (USA) students, aged 10 to 21 years, in grades 6-12, with different levels of exposure to the 9/11 terrorist attack. ¹⁵	CFA	Confirmed the four-factor solution: Active coping Avoidance Distraction Support seeking Reliability: not specified	Not assessed.
Kidcope ¹⁶ Younger children (ages 7-12) 15-item self-report. Older children (ages 13-18) 10- (or 11) item self-report. ¹⁷ Children/Adolescents	Community sample of 568 children in Florida (USA) directly exposed to Hurricane Andrew. ¹⁸	PCA	Four factors of situation-specific coping (with 13 items): Positive coping: $\alpha = 0.77$ Blame and anger: $\alpha = 0.53$ Wishful thinking: $\alpha = 0.67$ Social withdrawal: $\alpha = 0.43$	Kidcope Social Withdrawal negatively correlated with SSSCA scores. Kidcope Blame and Anger negatively correlated with SSSCA scores.
	Community sample of 138 adolescents and 123 children in New Orleans USA (all African-American) assessed 3 to 7 months after geographic exposure to Hurricane Katrina. ¹⁷	CFA EFA	CFA: Previous factor-solutions by Spirito and colleagues ¹⁶ and by Vernberg and colleagues ¹⁸ not confirmed. EFA: Among children, three factors of coping: Problem-Avoidant: $\alpha = 0.64$ Internalized Negative: $\alpha = 0.52$	Child version: Kidcope Internalized Negative coping positively associated with BASC-2 Anxiety, Depression, and Social Stress subscales. Kidcope Externalized Negative coping positively associated with BASC-2 Depression subscale. Adolescent version:

			Externalized Negative: $\alpha = 0.41$ Among adolescents, unitary factor of coping.	Kidcope unitary factor positively associated with BASC-2 Anxiety, Depression, and Social Stress subscales.
	Sample of 1,468 secondary school students aged 12 to 17 years, from 2 municipalities in Greece (Pyrgos and Amaliada), exposed in 2007 to major wildfire causing the death of 67 people. ¹⁹	CFA	Confirmed two-factor solution of situation-specific coping: Escape-oriented: $\alpha = 0.64$ Control oriented: $\alpha = 0.64$	Significant positive association between incidence of presumed PTSD and: Escape-oriented coping; and Control-oriented coping. Significant positive association between incidence of presumed depression and: Escape-oriented coping; and Control-oriented coping.
Responses to Stress Questionnaire (RSQ) ²⁰ 57-item self-report Adolescents and Adults	Community sample of 168 adolescents assessed 6 weeks after geographically distant exposure to 9/11 attacks. ²¹	CFA	Confirmed five-factor solution of situation-specific coping: Primary Control: $\alpha = 0.82$ Secondary Control: $\alpha = 0.76$ Disengagement: $\alpha = 0.76$ Involuntary Engagement: $\alpha = 0.90$ Involuntary Disengagement: $\alpha = 0.80$	RSQ Primary Control positively correlated with the CAC Concrete Activities and Social Support subscales. RSQ Disengagement Coping and Secondary Control negatively correlated with CAC Concrete Activities and Social Support subscales.
	Sample of 665 Bosnian adolescents aged 15 to 20 years, 5 years after the 1992-1995 Bosnian war. ²²	CFA	Confirmed four-factor and five-factor models of coping. Used four-factor model for parsimony: Primary Control: $\alpha = 0.79-0.85$ Secondary Control: $\alpha = 0.81-0.86$ Disengagement: $\alpha = 0.77-0.80$ Involuntary Engagement: $\alpha = 0.95-0.96$	Not assessed.
Schoolagers' Coping Strategies Inventory ²³ 26-item self-report questionnaire or interview ²⁴	Community sample of 310 children, aged 8 to 12 years, in Sarajevo assessed 4 years after geographic exposure to 1992-1995 war in Sarajevo, Bosnia, and Herzegovina. ²⁴	PCA	Two factors of general coping: Active/Creative Passive/Non-Productive Reliability: not specified	Not assessed.
Youth Coping in Traumatic Times ¹⁵ 15 items (14 used for analysis) Children and Adolescents	Sample of 4,564 New York (USA) students aged 10 to 21 years, in grades 6-12, with different levels of exposure to the 9/11 terrorist attack. ¹⁵	EFA CFA	Four factors of coping: Active coping Avoidance Distraction Support seeking Kuder-Richardson Formula 20 of factors ranged from 0.46-0.62.	Not assessed.
Six-item coping questionnaire ²⁵	Sample of 80 children aged 8 to 12 years, in grades 3-6, (in a community in Illinois USA) in contact with media coverage of the 1991 Persian Gulf War. ²⁵	PCA	Two factors of situation-specific coping: Cognitive coping: $\alpha = 0.58$ Social support: $\alpha = 0.48$	Not assessed.

Measure and Description	Characteristics of the Samples Studied	Statistical Technique for Identifying Factors	Factors Studied and Instrument Reliability In Study Sample (Cronbach Alpha)	Assessment of Construct Validity of the Coping Dimensions in the Study Sample
25-item coping questionnaire ²⁶ Children and Adolescents	Community sample of 492 Israeli children and adolescents assessed 3 weeks after taking shelter in a sealed room during Persian Gulf War Scud missile attacks. ²⁶ Studied a measure that included 13 of 25 original items.	PCA	Five factors of situation-specific coping: Checking Verbal Distraction Reassurance Request Distraction-Avoidance Wish Fulfillment Reliability: not specified	Checking and Reassurance Request positively associated with GSS. Verbal Distraction negatively associated with GSS.
Unfinished Sentences ^{27,28} Semi-projective, 6-item sentence completion related to military and political violence Children	Community sample of 185 Palestinian children; one-half assessed in 1985 before Intifada and one-half assessed during Intifada in 1992. ¹²	PCA	Six factors of situation-specific coping: Social Affiliation: $\alpha = 0.70$ Active Fighting: $\alpha = 0.68$ Hostile Confrontation: $\alpha = 0.60$ Problem reconstruction: $\alpha = 0.67$ Avoidant Distraction: $\alpha = 0.69$ Defenses: $\alpha = 0.68$	Not assessed.
45-item Instrument designed by Duraković-Belko, Kulenović, and Đapić ²⁹ (Based on an instrument designed by Lazarus and Folkman ³⁰)	Sample of 393 secondary school students (202 boys; 191 girls) from Sarajevo, aged 17 years on average, exposed to the Bosnian war (1992-1995). ³⁰	PCA	Nine factors of coping: Problem solving Social support Reinterpretation Avoidance Inaction (resignation) Religion Daydreaming Expression of emotions Humor Reliability: not specified	Significant positive association of PTSD symptoms with: Daydreaming; Religion; and Expression of emotion.

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Table 1. Coping Instruments Used in Child Disaster, Terrorism, and War Studies

Abbreviations: BASC-2, Behavioral Assessment Scale for Children, Second Edition; CAC, Coping Activities Checklist; CFA, confirmatory factor analysis; COPE, Coping Orientation for Problem Experiences; CPTSRI, Child Posttraumatic Stress Reaction Index; EFA, exploratory factor analysis; GSI, Global Severity Index; GSS, Global Symptom Score; PCA, principal component analysis; PSSA, Personal Stress Symptom Assessment; PTS, posttraumatic stress; PTSD; posttraumatic stress disorder; RSQ, Responses to Stress Questionnaire; SSSCA, Social Support Scale for Children and Adolescents.