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Trauma exposure in elementary school children: Description of screening procedures, level of exposure, and posttraumatic stress symptoms

Araceli Gonzalez, PhD* [Assistant Professor],

California State University, Long Beach, Department of Psychology 1250 Bellflower Blvd., Long Beach, CA 90840-0901

Nicholas Monzon, BA,

California State University, Long Beach, Department of Psychology 1250 Bellflower Blvd. Long Beach, CA 90840-0901

Diana Solis, BA,

UCLA Semel Institute for Neuroscience and Human Behavior 1000 Veteran Avenue, Box 957142 Los Angeles, CA 90095

Lisa Jaycox, PhD [Senior Behavioral Scientist], and

RAND Corporation 1200 South Hayes Street Arlington, VA 22202

Audra K. Langley, PhD [Associate Professor]

UCLA Departments of of Psychiatry and Pediatrics 1000 Veteran Avenue, Box 957142 Los Angeles, CA 90095

Abstract

Traumatic childhood events can have a significant impact on overall child functioning. Early identification and intervention could offer significant benefits for children's mental health and educational trajectories, but how to effectively identify young children is a challenge. In this paper, we describe screening for exposure to traumatic events and associated symptoms of posttraumatic stress, and examine differences by child gender and grade level. A total of 402 elementary school children in grades 1-5 participated across four elementary schools. We describe modified administration procedures of screening instruments for these young children. Children who endorsed exposure to one or more traumatic events were individually assessed for posttraumatic stress symptom severity. Thirty-four percent (n=138) of children screened experienced one or more traumatic events, and 75.4% of those exposed to at least one traumatic event endorsed moderate levels or higher of posttraumatic stress symptoms. Internal consistency of the symptom self-report instrument was adequate for children of all grade levels. Posttraumatic stress symptom severity increased for children exposed to more types of events. No gender/grade differences were found in symptom severity. Findings suggest that young children are impacted by traumatic events in relatively high numbers, that they can reliably report their posttraumatic stress symptoms, and that a large portion of those exposed to trauma experience significant distress. These results

^{*}Corresponding author Phone: 562-9858979, Fax: 562-985-8004, Araceli.Gonzalez@csulb.edu.

highlight the importance of early screening and identification of these children to curtail potential risk for future academic, social, and psychological maladjustment.

The need for school-based mental health screenings to identify potential mental health concerns in youth is well-established. There have been several national calls to improve and expand school mental health programs, and suggestions for doing so often involve universal screening to increase identification of child mental health problems in their earliest stages (e.g., Dowdy, Ritchey, & Kamphaus, 2010; Fazel, Hoagwood, Stephan, & Ford, 2014; The President's New Freedom Commission on Mental Health, 2003). Early childhood symptoms may develop into chronic or more severe problems over development and are significantly associated with school functioning years later. Indeed, psychological functioning in early elementary school (1st grade) has been shown to predict academic achievement years later (4th grade; Guzman et al., 2011). However, only a small proportion of schools routinely conduct mental health screening (Romer & McIntosh, 2005). Given that emotional and behavioral symptoms at a young age often predict the development of future psychiatric disorder, early screening and detection is critical in minimizing risk for future emotional, academic, and social difficulties (e.g., Essex et al., 2009; Albers, Glover, & Kratochwill, 2007). Elementary school children are building the foundation for future school functioning as they meet critical educational milestones (e.g., developing literacy and arithmetic skills), screening during this particular developmental period should be an educational and public health priority.

Challenges in screening elementary school children

School-based screenings at any grade level present several practical barriers, including limited funding and staffing to conduct screenings, as well as concerns regarding follow-up after youth are identified (Levitt, Saka, Romanelli, & Hoagwood, 2007). Self-report of experiences and symptoms may be an efficient way of screening that minimizes required training and burden of administration and scoring. However, screening of young schoolchildren using self-report may present several methodological challenges given children's developmental level. Concerns inherent to self-report measures, including subjectivity, poor reliability, and validity of responses, are heightened in a young age group who may not yet possess the cognitive skills to comprehend complex questions or reflect upon internal experiences. While several tools for assessing psychological symptoms in young children exist, including the use of puppets and stories and play narrative techniques (e.g., Luby, Belden, Sullivan, & Spitznagel, 2007), such approaches may lack feasibility for large-scale screenings in school and clinical settings given the time required for administering and coding child responses. Fortunately, data supporting the reliability and validity of assessment tools with elementary school are increasing; studies have demonstrated acceptable test-reliability and predictive validity with respect to future mental health, and significant concordance with reports of parent and teacher informants (Ialongo et al., 2001; Luby et al., 2007). While young school children may lack reading skills and vocabulary to complete many assessment instruments independently; alternative modes of administration (e.g., verbal administration) may circumvent concerns about reading levels.

Despite the challenges associated with screening children using self-report instruments, there a number of potential advantages of this method that may justify attempts to navigate these challenges. Traditional school-based referral procedures, including teacher identification and nomination of students, may not adequately identify all youth in need and may be particularly subject to bias (Husky, Kaplan, McGuire, Flynn, Chrostowski, & Olfson, 2011; Severson, Walker, Hope-Doolittle, Kratochwill, & Gresham, 2007). This method of identification may over-identify youth who have more severe problems and have already demonstrated aspects of adaptational failure (e.g., conduct problems, academic underachievement, poor peer relations) while failing to detect youth with more covert internalizing symptoms (e.g., anxiety and fearfulness, depression) (Cunningham & Suldo, 2014; Dvorsky, Girio-Herrera, & Sarno Owens, 2014). Consistent with this, internalizing problems, including Posttraumatic Stress Disorder (PTSD), are underrepresented in both school- and clinic-based services (Garland et al., 2001). This is problematic because these common problems can significantly interfere with several domains of child socioemotional development.

Rationale for screening for trauma exposure in elementary school children

School-based screening for exposure to trauma may be useful for identifying a large number of youth at risk for a variety of negative outcomes and thus may improve efficiency of screening. Research to date shows that trauma exposure is common – before the age of 17, approximately two-thirds of youth will be exposed to some form of traumatic event (Briggs-Gowan et al., 2010; Copeland et al., 2007; Finkelhor, Turner, Ormrod, Hamby, & Kracke, 2009). While not every youth who experiences a traumatic event will develop PTSD, even subclinical or partial PTSD symptoms pose significant risk for the development of several other mental health disorders (Copeland, Keeler, Angold, & Costello, 2007). Importantly, trauma exposure and associated symptoms have also been linked to poorer functioning in academic settings, including decreased social competence, increased rates of peer rejection, decreased reading ability, lower grade-point average, more days of school absence, and decreased high school graduation rates (Delaney-Black et al., 2002; Grogger, 1997; Hurt, Malmud, Brodsky, & Giannetta, 2001). Such findings illustrate how this single common risk factor can initiate several maladaptive developmental pathways. A public health approach involving school-based screening for exposure to traumatic events may maximize detection of youth at risk for a broad array of adverse outcomes, and early detection can ameliorate or prevent difficulties in emotional, behavioral, social, and academic functioning.

To date, there are several gaps in the current research base and the full extent of trauma exposure in a general population of elementary school children is unclear. Previous research on level of youth exposure to traumatic events has predominantly focused on adolescent populations and school-based findings in elementary school children have yielded a vast range of estimates, from 14% to 40% (Alisic, van der Schoot, Ginkel, & Kleber, 2008; Stein et al., 2003). Further, many studies of trauma exposure among children have recruited special populations, such as those with existing psychiatric disorders (e.g., ADHD, oppositional defiant disorder; Ford, Racussin, Daviss, et al., 2000) or survivors of natural disasters or child maltreatment (Gabbay, Oatis, Silva, & Hirsch, 2004). Studies using specialty samples may produce higher estimates that cannot be generalized to a community

sample of school children. Next, age differences in level of exposure are also unclear; while some studies have detected a positive association between age and trauma exposure (Alisic et al., 2008; Copeland et al., 2007), others have not (Stein et al., 2003). Finally, while a handful of smaller studies have focused on exposure to very specific events (e.g., natural disaster, terrorism or war trauma), many of the large national surveys of youth trauma exposure have focused on exposure to community violence (e.g., Finkelhor et al., 2009; Freeman, Mokros, & Poznanski, 1993; Kilpatrick & Saunders, 1999; Schwab-Stone, Ayers, Kasprow, & Voyce, 1999). Inquiry about a variety of traumatic events, including both interpersonal (e.g., community trauma, assault) and non-interpersonal (e.g., car accidents, natural disasters, animal attacks) events, would provide more realistic estimates regarding level of trauma exposure in children as well as useful information about the events to which children are most likely to be exposed.

School-based screening for trauma exposure provides access to a general population of children, including those who are not yet exhibiting emotional, behavioral, or academic difficulties. This is critical because early identification and intervention could offer significant benefits for children's mental health and educational trajectories. For instance, the few studies of school-based mental health intervention for trauma-exposed children provide promising support for the benefits of such services, indicating that school-based cognitive-behavioral interventions can effectively reduce posttraumatic stress symptoms in trauma-exposed children and early adolescents of diverse backgrounds (Langley, Gonzalez, Sugar, Solis, & Jaycox, in press; Kataoka et al., 2003). Identification of children who would benefit from such services may be enhanced using screening procedures rather than traditional referral methods.

Current study

The present study employed a school-based screening approach to identify children exposed to one or more traumatic events and assess subsequent symptoms of posttraumatic stress. This study addresses several gaps in the existing literature by screening a diverse community of elementary school aged children (i.e., non-specialty sample), assessing several types of traumatic events (interpersonal and non-interpersonal), and examining differences in trauma exposure and associated symptoms by gender, grade level, and type of traumatic event. Specifically, our goals are to (a) describe the modified administration procedures for screening children for exposure to traumatic events in the elementary school setting, (b) report the level of trauma exposure in young schoolchildren (grades 1-5) and frequency of exposure to specific types of events, and (c) examine traumatic stress symptom severity of children with trauma exposure, including any potential differences by child gender and grade level. Based on previous work in similar regions, we anticipated that rates of trauma exposure would be comparable to those reported in studies conducting universal screening in middle and high schools. Finally, we did not anticipate detecting gender or grade level differences in trauma exposure or symptom severity. In addition, we conducted a preliminary examination of the reliability of our screening method in young children using developmentally-modified administration of self-report instruments; we anticipated that our modified screening procedures would yield reliable child reports.

Method

Participants

All procedures were approved by the institutional review board. A total of 402 children (1st – 5th grade; 51% boys) participated in screening for exposure to traumatic events during the 2011-2012 and 2012-2013 school years at four elementary schools in a southern California school district. All four schools serve a diverse ethnic and linguistic student body from grades K-5 and qualify as Title I schools under the No Child Left Behind Act of 2001, indicating that at least 40% of the students were eligible for free or reduced lunch. Because we were interested in sampling students across several school campuses, only two grade levels were screened at each school per academic year. The grade levels screened at each school changed from the first to second year to broaden grade level sampling at each school. During the first year, the grade level to be screened was randomized at each school. In the second year, a different grade level was chosen at each school and we ensured that the grade level did not overlap with the students who were screened the previous year in Year 1. In addition, one school was an English/Spanish immersion public school and the school Principal requested that we screen students in grade 2 and older because not all students in 1st grade had learned to read in English yet.

A total of 1,050 parental consent forms were distributed with 789 (73%) returned and 417 (53%) providing consent for child screening. Of these, 402 children completed the screening for exposure to traumatic events. Parents provided written consent for screening but did not participate in any of the described screening procedures.

To ensure that screening procedures were sustainable, data collection was designed to maximize brevity and accordingly we recorded only gender and grade level for participants. We did not collect racial/ethnic demographic data for the screened sample. However, as a whole, each school is racially/ethnically diverse; three of the four schools have a majority Hispanic or Latino student body (76.9%, 50.5%, and 39%; data obtained from school district records).

Measures

With feasibility and sustainability in mind, assessment measures were selected with consideration of their psychometric properties as well as their low-cost availability and ease of administration and scoring. Several adaptations were made to assessment procedures in order to make them appropriate to the developmental level of children, which we describe in more detail below.

Trauma exposure—The Modified Traumatic Events Screening Inventory for Children – Brief Form (TESI-C-Brief; Daviss et al., 2000; Ford, 2008), child version, was used at baseline to assess exposure to direct or witnessed trauma via 21 items and has been normed and validated with youth ages 6-17, and field tested with children as young as age 3. This measure is typically clinician-administered in interview format for children under age 11. Items query a range of traumatic experiences, including accidental trauma (e.g., car accident, injury), physical abuse, violence, loss of loved ones, and substance abuse exposure. The

TESI has been used extensively by the National Child Traumatic Stress Network (SAMHSA) (Edwards & Rogers, 1997) and reviews of instruments to measure history of traumatic events support its strong psychometric properties, including reliabilities of > .80 and interrater reliability ranging from .73-1.00 (e.g., Ribbe, 1996). Per the request of school administrators, we did not ask children about sexual abuse histories. Parents did not participate in the screening; data provided here are based solely on child report.

Posttraumatic stress symptoms—Those students who endorsed at least one traumatic event on the TESI-C were then administered the UCLA Posttraumatic Stress Disorder Reaction Index (RI) (Pynoos, Rodriguez, Steinberg, Struber, & Fredrick, 1998), a 20-item child report of posttraumatic stress symptom frequency during the previous month. This measure has been field tested and validated with children as young as age 7. Items correspond to symptoms listed in DSM-IV PTSD criteria and are rated on a 5-point Likerttype scale from Never (0) to Most of the time (4). As described below in Procedures, screening staff used a visual aid to help children comprehend the scaling for each item response. The questionnaire includes subscales corresponding to DSM-IV subdomains (reexperiencing, avoidance/numbing, hyperarousal). The questionnaire was administered verbally by research staff to children who endorsed at least one item on the TESI. This instrument has been used among a variety of samples experiencing a variety of traumas with strong support for internal consistency, test-retest reliability, and convergent validity as evidenced by agreement of cut-off scores with a diagnosis of PTSD (Steinberg, Brymer, Decker, & Pynoos, 2004). A total score of 38 is most sensitive and specific to a DSM-IV diagnosis of PTSD (Steinberg et al., 2004), however, children with scores in the 20-25 range may be considered to have moderate symptoms of posttraumatic stress (e.g., Cohen, Mannarino, & Staron, 2006; Langley et al., in press). Given our goal of screening to identify youth at earliest stages of symptoms, in this study we used a RI severity total score of 20 to identify children with at least moderate posttraumatic stress symptoms.

Procedures

Written parental consent—Parental consent forms for screening were distributed the first week of the school year (September) and accompanied paperwork that is typically sent home the first week of school (e.g., emergency contact cards). The consent forms included checkboxes where parents could indicate "Yes" they provided consent or "No" they declined consent for their child to participate in screening for exposure to traumatic event, and a signature was required. In this particular school district, all students have a folder that goes home to their caregivers on the same day each week; if signed consent forms were not returned with the initial packet, then a new copy was sent home in the child's weekly folder for up to two weeks, and teachers were asked to provide a verbal reminder to parents if they had any contact with them (i.e., when picking the child up from school). To incentivize the return of consent forms, teachers were informed that the classroom with the highest consent form *return rate* (regardless of whether the parent provided or declined consent) would earn funds for a pizza party.

School screening—Each of the four schools had three designated full-day screening days, plus a half-day to screen children who were absent on the first three assessment days.

Screening occurred during class time and students were not invited to screen during lunch or recess. Research staff screening teams were comprised of one PhD-level clinician who supervised a team of three to five graduate students who completed the screening questionnaires with the children at each school.

On screening days, a team of screeners was provided a large room, or multiple smaller rooms depending on the logistics of each school, where children were screened. Children whose parents/guardian provided written consent were individually retrieved from their classrooms by the screeners and escorted to the screening room, where staff verbally administered the screening instrument. Children first completed the TESI to indicate whether they had experienced certain traumatic events, and children who endorsed experiencing one or more traumatic events in their lifetime complete an additional questionnaire to report the severity of posttraumatic stress symptoms using the RI.

Research staff administering the screening instruments stationed themselves at desks or tables spread out across the room far enough from one another so that students could not hear or see one another's responses. Once screening was completed with each child, children chose a reward from a box of school supplies and small toys and were then escorted by staff back to their classrooms. Research staff attempted to accommodate to any specific teacher requests about when best to and not to pull certain students out of class (e.g., if a student struggled with math and teacher requested that a student not be pulled out of class during the scheduled math time, screening staff made a note and attempted to screen the child during another scheduled activity). Screening staff were instructed to end the assessment on a positive note by asking students about things they enjoy (e.g., their pets, fun activities they have scheduled that week), and not to return children to their classrooms until they observed neutral or positive affect. Total screening duration per student was 5-10 minutes for students who did not endorse a traumatic event and approximately 15-25 minutes for students who endorsed one or more events.

Modified administration of instruments—For consistency, instruments were verbally administered to all children because some of the younger children had not yet developed adequate reading skills. Screening staff met individually with each child and sat side-by-side so the child could read along while screening staff read each item aloud to the child. Children were able to point to their answers or to mark their own answers, depending on their preference.

Several steps were taken to enhance child understanding of each screening measure. To ensure comprehension of the content of the questions on the TESI, screening staff were instructed to ask children if they knew the definitions of certain words (e.g., "violence," "threatened"); if children said "Yes" then screening staff asked the child to define the word, and if they said "No," then screening staff provided the definition. In addition, screening staff queried using specific concrete examples to ensure the child's understanding of the question. For example, there were several instances when a child answered "No" to a question regarding exposure to community violence, but then answered "Yes" when asked if they have heard gunshots in their neighborhood. In addition, because younger children may have literal interpretation of some items, screening staff were instructed to specify "not on

TV" for several of the TESI items (e.g., have you seen a serious accident where someone was hurt badly or died?). Lastly, steps were taken to minimize risk of false positive responses given that younger children are likely to make literal interpretations of questions. If a child answered "yes" they had experienced a traumatic event, the child was probed further to assess the intensity of the situation to determine whether the event appeared like an actual traumatic event. For example, if a child endorsed having been hit or pushed, the screener asked follow-up questions to determine the nature of the physical fight (e.g., physical attack from a stranger or peer vs. a minor quarrel with a sibling); if a child said they had been bitten by a dog, the screener probed the severity of the bite (e.g., breaking skin and requiring stitches vs. a puppy nipping the child during play).

Students who endorsed more than one item on the TESI (n = 138) were asked which of the event was most personally upsetting (e.g., "which of these things makes you feel most afraid or sad?") and subsequently completed the RI based on the event that the child endorsed as most upsetting. The RI is a dimensional measure of posttraumatic stress symptom severity, and because children may have difficulty understanding the scaling of each item (0-4), screening staff used a visual graph to represent the five response options on the rating scale. This visual aid was similar to a *feelings thermometer* commonly used in clinical research and practice with young children (Silverman & Albano, 1996); it was a sheet of paper displaying five three-dimensional cylinders filled to varying levels to represent the degree of presence or absence of certain symptoms. An empty cylinder corresponded to "0 = Nevet" or not at all, and a full cylinder corresponded to "4 = Most of the Time" or very much. For each item, children were able to point to the quantity that best described them. To assess children's understanding of the scale, screening staff completing a few practice items with each child (e.g., *I like to go to the dentist*, or *I like recess*).

Post-screening referrals—Children identified as having elevated posttraumatic stress symptoms in this study were referred for participation in a school-based cognitive-behavioral intervention for children exposed to trauma at each of their schools (Langley et al., in press), or another source if desired.

Analyses

All analyses were conducted using SPSS Version 21. ANOVAs were used to check for potential differences between schools. T-tests were used to assess differences between genders and between youth who scored 20 or higher and less than 20 on the Reaction Index (RI). Correlations were used to evaluate the association between grade level and trauma exposure and symptom severity. Chi-squared tests were used to assess differences in types of event between genders, youth above and below the clinical cutpoint of significant posttraumatic stress symptoms, and between schools.

Results

A total of 402 elementary school students in grades 1-5 participated. Student gender and grade level are listed in Table 1. We checked for differences between schools and found no significant differences between the four elementary schools in terms of proportion of children exposed to one or more events ($X^2(3, N = 402) = 2.75, p = .124$), mean number of

traumatic events endorsed among those exposed (R(3,137) = .476, p = .699), or severity of RI symptoms (R(3,133) = .151, p = .959). Therefore, we collapsed across school in analyses. In addition, we examined potential differences in level of trauma exposure (TESI total score) between children who participated in the first year of the study and the second year of the study and did not find any differences exposure to traumatic event across the two years ($t_{400} = -.001$, p = .994). Similarly, there were no significant differences in RI score between those who participated in the first and second years of the study ($t_{132} = -1.23$, p = .627). Therefore, we also collapsed across school years in our analyses.

Exposure to traumatic events

Level of exposure—Thirty-four percent (n=138) of children endorsed experiencing one or more traumatic event(s) during their lifetime. Trauma-exposed children reported a range of 1 to 12 types of events, with a reported mean exposure to 2.58 types of events (SD = 1.75) across all schools. Table 2 lists types of events endorsed by order of frequency. The five most frequently reported types of traumatic events were: witnessed/know of family member arrested or deported (28%), witnessed physical (22%) or community violence (21%), victim of physical violence (17%), and witnessed a serious accident (17%). Number of traumatic event types was significantly and positively correlated with posttraumatic stress symptom severity (r = .39, p < .001).

Gender and age differences in frequency and type of exposure to trauma—Out of the 138 children who were exposed to at least one traumatic event, 68 were male and 70 were female (Table 2). There were no significant gender differences in mean number of different types of traumatic events to which they were exposed, t(136) = .540, p = .590. However, there were significant gender differences in exposure to two specific types of events. More boys than girls endorsed experiencing the death of a loved one (X^2 (1, N = 136) = 9.977, p = .002) and physical harm from another (X^2 (1, N = 138) = 5.402, p = .020). There was no significant difference between grade level and the mean number of traumatic events (T^2 (4, N=136) = 2.249, T^2 = .067), or in exposure to the top five most frequently reported events (T^2 (4, N=136) = 2.63-3.79, all T^2 = .434-.622). Grade level and mean number of traumatic events were not significantly correlated (T^2 = .086, T^2 = .319), indicating that exposure to traumatic events did not increase with age in this sample.

Posttraumatic stress symptoms

Reliability—Across all children in this sample, Cronbach's α = .85 for children's report on the RI. Cronbach's alpha for each grade is as follows: 1^{st} : α = .90; 2^{nd} : α = .82; 3^{rd} : α = .87; 4^{th} : α = .88; 5^{th} : α = .92, indicating that internal consistency was good to excellent for all grade levels.

Symptom severity—Of the children who reported at least one traumatic event, 104 (75.4%) endorsed current posttraumatic stress symptoms in the moderate range (total score 20). Importantly, 9.5% of the entire screened sample was likely to meet DSM-IV diagnostic criteria for PTSD based on the clinical cutpoint of total score 38 that is suggested in some published works (Steinberg et al., 2004). The 104 children who scored a 20 or above on the RI were compared to the 34 children who endorsed exposure to a traumatic event but whose

symptoms of posttraumatic stress were below 20 on the RI. Children who scored below and above the RI cutoff did not differ in school attended (X^2 (3, N = 135) = 3.609, p = .307) or type of traumatic events endorsed (all ps < .05). By contrast, children who scored above the RI cutoff endorsed a significantly higher number of types of traumatic events (M = 2.86, SD = 1.792) than children who scored below the cutoff score (M = 1.77, SD = 1.383), t(133) = -3.094, p = .002.

Gender and age differences in posttraumatic stress symptom severity—There were no significant differences between gender or grade level in symptom severity for total posttraumatic stress (RI Total score) or for any of the RI subscales (re-experiencing, avoidance/numbing, hyperarousal) (all ps > .05). A higher proportion of children in the 3^{rd} grade scored a RI total score of 21 than children in the other grades (1^{st} , 2^{nd} , 4^{th} , or 5^{th}), X^2 (4, N = 135) = 13.549, p = .009; however, the grade level and RI symptom severity were not significantly correlated (r = -.08, p = .34).

Discussion

The objective of this study was to describe procedures for screening elementary school children for exposure to traumatic events and to report the extent of exposure and severity of posttraumatic stress symptoms. Results indicate that over one-third of elementary school children reported exposure to traumatic events and suffered associated symptoms of posttraumatic stress, and that levels of exposure and symptom severity were similar to those of older elementary schoolmates. Further, a significant portion of trauma-exposed children reported experiencing significant distress.

This study uniquely contributes to research in this area in two primary ways. First, this study provides promising support for successful and reliable screening using children's self-report. Screening procedures with young schoolchildren were successfully implemented using modified administration of instruments. Developmentally-appropriate modifications included verbally administering screening instruments, simplifying language and defining unknown words, distinguishing events that occurred in real life from those viewed on television, and using a visual aid to help students understand and select response options for items assessing symptom severity. Some school-based screening approaches rely on teacher informants, but this method alone may fail to identify youth who are not already exhibiting signs of academic dysfunction (Albers et al., 2007; Severson et al., 2007). Indeed, anecdotally, several teachers expressed their surprise about some of the children referred for a subsequent school-based group intervention, stating that they had not perceived any difficulties in the children in the school setting despite the child's self-reported emotional distress and impairment in other areas. This underscores the importance of universal screening for early identification of children prior to the expression of overt adaptational difficulties. Taken together, these results suggest that a multi-method, multi-informant approach, including children's report, may hold most promise in identifying children in need.

In addition, children's reports yielded good internal consistency across all grade levels, which is consistent with existing studies that children can reliably report their internalizing

symptoms. Indeed, data supporting the reliability and validity of assessment tools with this age group are increasing. Developmentally-appropriate measures using puppets and play narrative have produced significant correlations with other self-reports of children's symptoms, and several studies indicate that young children's self-report of symptoms reliably predict future functioning and significantly correlate with reports from adult informants. Ialongo and colleagues (2001) found that first grade students' self-report of anxiety symptoms demonstrated good test-retest reliability and predicted future academic achievement and symptoms of suicidal ideation and depression better than those reported by adults. Another study or preschool students revealed significant correlations between young students' report of internalizing symptoms and those reported by their parents (Luby et al., 2007). Taken together, results regarding child-self reports of internalizing symptoms are favorable and suggest a promising avenue for further research.

Second, this study helps to clarify the level of trauma exposure in children by screening a diverse community of elementary school aged children, inquiring about exposure to a variety of interpersonal and non-interpersonal traumatic events, and exploring differences in trauma exposure and symptoms with regard to gender, grade level, and type of traumatic event. Across four elementary schools, 34% of children endorsed exposure to one or more traumatic events during their lifetime. The proportion of trauma-exposed children in this young sample was comparable to those reported in other studies that included adolescent samples, ranging from 25.2% to 72% (e.g., Copeland et al., 2007; Costello, Erkanli, Fairbank, & Angold, 2002; Finkelhor, Ormrod, Turner, & Hamby, 2005; Finkelhor et al., 2009; Kataoka et al., 2003; Stein et al., 2003). The rates in this sample are similar to those reported in a sample from a different southern California school district with predominantly low-income Latino children in elementary and middle school (31-32%; Jaycox et al., 2002; Kataoka et al., 2003), although these previous studies focused on exposure to violence and may be higher when all types of traumatic events are considered. However, these samples were more geographically and racially/ethnically comparable to children in the present study than to other studies of trauma exposure in school children that reported lower rates of exposure. For instance, trauma exposure in the present study is substantially higher than that reported by Alisic and colleagues (2008), who observed a prevalence of 14% in their sample of 1,770 Dutch school children. Differences in these rates may be in part to national differences in community violence and risk for deportation. Further, present findings are inconsistent with previous studies suggesting positive associations between trauma exposure and youth age (Alisic et al., 2008; Briggs et al., 2013). Present results indicate that elementary school children were similarly affected by trauma exposure and highlight the need to screen younger children to maximize early detection and intervention, although further work is needed to understand family- and community-level factors that are associated with decreased trauma exposure in young children in order to understand these discrepancies.

A contribution of this study is the assessment of level of posttraumatic stress symptoms in addition to extent of exposure. Of the 138 children who endorsed exposure to one or more traumatic events, 75.4% (25.9% of entire screened sample) reported moderate levels of posttraumatic stress symptoms (RI 20). Notably, over one-third of children exposed to a traumatic event endorsed symptoms in the clinical range that suggests potential diagnosis of

PTSD (36.5%; 9.5% of the entire screened sample); this approaches the overall rate of PTSD in a recent meta-analysis of children and adolescents (Alisic, van Wesel, Larsen, Hafstad, Hassanpour, & Smid, 2014). Results of this study are also consistent with previous studies indicating that exposure to multiple events was associated with increased posttraumatic stress severity (Greeson et al., 2014; Suliman et al., 2009). In this study, symptom severity did not systematically increase with age, suggesting that younger trauma-exposed children reported similar levels of distress than their older schoolmates. Unexpectedly, a slightly but significantly higher proportion of children in 3rd grade reported symptoms above the clinical cutpoint than did children of other ages (see Table 1). This difference was perhaps due to sampling error, as there were no known significant community or school differences to explain this.

An additional contribution of the current study is the focus on the nature of the types of events endorsed by children. In the present study we did not disaggregate type of event to examine symptoms severity by type of trauma exposure (because many children endorsed multiple events and thus overlapped), however, we report on frequency of different events and differences in frequency of exposure to different events by gender and grade level. The most frequently reported type of event reported in this study was traumatic loss or separation (including deportation and arrests). Similarly, 40% of children ages 6-11 in a large national study reported loss and separation (Briggs et al., 2013). Together, these data suggest that traumatic events in childhood need not be life-threatening or violent to infer risk for later significant clinical symptomatology. This increases awareness of the impact of child separation from parents due to incarceration or deportation if these events are common in a given community. Results also suggest that, even though we did not detect gender differences in frequency of exposure to traumatic events, the types of events to which they are exposed may vary. For example, boys more frequently reported physical harm from others; knowledge regarding gender-specific risks for exposure to certain types of events can inform targeted prevention efforts. Although age-related exposure to different types of events did not emerge in this study, previous national surveys have reported significant developmental trends in exposure to different types of direct and indirect violent victimization (Finkelhor et al., 2009). This difference may be due in part to our restricted middle childhood age range; additional studies are needed to assess level of exposure to interpersonal and non-interpersonal traumatic events in youth across a child and adolescent development (i.e., 0-17 years).

Limitations

Data collection was designed to maximize brevity of screening procedures in order to support feasibility and future sustainability in a real world setting. Thus, results of the present study should be interpreted in light of the following limitations. These data rely solely on child report, and a comprehensive multi-informant approach may provide more accurate and reliable data regarding the child's emotional and behavioral functioning. Because we only have child report on the experience of specific traumatic events, we are unable to examine the reliability (e.g., kappa) of child report of exposure to traumatic events. Although we provide data to support the racial/ethnic diversity of the schools sampled, racial/ethnic data were not collected for this screened sample. This information would be

important for investigating potential group differences in rate of consent and level of trauma exposure. Next, this sample includes more children in 2nd through 4th grades with fewer children in 1st and 5th grades. Thus, present results may not represent the youngest and oldest elementary school children. A sample with more representative numbers across all grade levels is needed to examine potential developmental differences in trauma exposure and symptoms within this age group. This study may also underestimate the level of trauma exposure in children for two primary reasons. First, participation in this study required written consent from parents or legal guardians and we cannot rule out a selection bias. It is possible that parents of children exposed to trauma opted out of screening so as to preserve family privacy; however, it is also possible that parents of children without trauma histories opted out because they viewed the project as not applicable to their child. Second, at the request of school officials due to concerns about parental reactions, we did not ask children about exposure to sexual trauma. Therefore, our estimates do not include children who have only experienced this type of event.

An additional limitation is that, although the present screening procedures were generally brief, it took up to 25 minutes to complete screening for some children who endorsed traumatic events. This will need to be considered when planning school screening efforts. Notably, however, screening took approximately five minutes for the majority of students, as most children did not endorse any traumatic events. Screening duration was longest for students who endorsed multiple traumatic events, required behavioral management due to distractibility, or who may have been triggered (e.g., appeared sad) and required a few minutes of positive activity before returning to class. In addition, even the longest screening assessments were shorter than the average screening duration of some nationally representative surveys (e.g., 45 mins; Finkelhor et al., 2009).

Finally, the instruments used only provided information regarding the types of traumatic events experienced and did not provide information regarding multiple exposures to the same type of event. This precludes our ability to determine the consequences of repeated or chronic exposure to the same type of event (e.g., physical assault), which may have deleterious effects on developing children. In addition, we inquired about lifetime exposure to different types of events and do not have data about when the events were experienced (i.e., time elapsed since trauma exposure). Further work is needed to determine whether more recent exposure to trauma is associated with greater symptoms in children, as it has been among adults (Amir, Kaplan, & Kotler, 1996). This would also be helpful in determining the relative associations between type of event and recency of exposure to symptom severity. Relatedly, research is needed to determine whether children's reports are more reliable for recent events. Similarly, we did not collect data regarding a number of other potential vulnerability factors that could aid our understanding of youth at highest risk for trauma exposure, nor did we conduct diagnostic interviews to capture the prevalence of PTSD or assess academic functioning. These data would provide a more comprehensive understanding of the psychological and educational consequences of trauma exposure.

Implications and future directions

The present study has several implications for school-based mental health screening and services. Trauma exposure was higher than reported in some previous studies of schoolchildren, and it is likely that many children would not have been identified by an indicated or teacher-referred screening process. As noted in our Introduction, the detrimental effects of posttraumatic stress and psychological disorders on short- and long-term educational performance are well-documented. Thus, it behooves schools to address both the physical and mental health needs of students to optimize their likelihood of academic success. Early identification is critical to early intervention that may mitigate or alleviate the progression of behavioral and emotional difficulties that may interfere with educational goals. Because the majority of research on trauma exposure in children has been conducted in clinical settings or with adolescent populations, data from this school-based study may be eye-opening and are particularly relevant to school officials and mental health professionals seeking support for bringing mental health resources to their school. This may also underscore the need for wide scale screening (rather than teacher identification) and provide schools with a rationale for increasing the availability of mental health resources and services in elementary schools.

In addition, this study adds to existing data that elementary school children are able to report on trauma exposure and associated symptoms in a reliable manner, and can be screened using relatively brief, previously-validated instruments. Further research is needed to determine whether score cutoffs to identify at-risk youth are similar across child development, and to evaluate whether any particular items produce biased responses from younger children. Current data also suggest that over one-quarter of children exposed to trauma did not develop significant posttraumatic stress symptoms, suggesting resiliency. Future work is needed to examine protective factors in such students to help inform prevention strategies. Finally, in this manuscript we did not disaggregate by type of traumatic event to examine differences in posttraumatic stress symptom severity. However, previous research indicates that different types of traumatic events (e.g., interpersonal vs. non-interpersonal) may present distinct patterns (e.g., increased externalizing symptoms) and severity of posttraumatic stress symptoms (Luthra et al., 2009; Price, Higa-McMillan, Kim, & Frueh, 2013). Such research might inform prevention efforts targeting traumaexposed children who may be at highest risk for future maladjustment, and may help to improve accuracy of diagnosis when different symptom profiles are present.

A critical next step is to assess the sustainability of screening procedures and subsequent referral systems and services to ensure that schools are able to continue screenings beyond the duration of an active research protocol. At the end of this study, current investigators held year-end meetings with school administrators and other stakeholders to present results of the study and to discuss sustainability and implementation of the screening and intervention independent of the study team. For example, one school administrator presented the idea of consistently implementing a universal screening for a particular grade level each school year (e.g., at a given school all 2nd grade students receive mental health screenings each year). Such a plan may be beneficial because it is more feasible than a school-wide screening and focuses on early identification. Several publications offer guidelines and

suggested frameworks for developing and implementing sustainable universal screening procedures in school settings, which include suggestions to increase institutional readiness for screening and subsequent referrals for services (Dowdy et al., 2010; Dvorsky et al., 2014 – we refer readers to these publications for further information). Future work is needed to evaluate the success of such efforts.

In sum, results support calls to increase school-based screening of mental health in elementary school children. While the rationale for such screenings are clear, issues of implementation of screening procedures present challenges for many schools. However, trauma exposure was prevalent and distressing in young students and school-based mental health services may optimize access to children in need. From the school's perspective, early school-based screening is needed to identify children who may be particularly vulnerable to symptoms of posttraumatic stress during a developmental period that may interfere with valuable early educational milestones (e.g., developing reading skills). From a public health perspective, screening for youth with trauma exposure, a risk factor for numerous adverse outcomes, may identify many children who would benefit from prevention and intervention.

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 Table 1

 Prevalence of Trauma Exposure and Posttraumatic Stress Symptoms in Children

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	Screened			No. exposed to	No. with
	Year 1	Year 2	Total	traumatic event (TESI 1)	symptoms in moderate range or higher (RI 20)
Total	235	167	402	138 (34.3%)*	104 (25.9%)
Gender					
Boys	118	87	235	68 (33.2%)	52 (25.4%)
Girls	117	80	167	70 (35.5%)	52 (26.4%)
Grade Level					
1 st	42	36	78	29 (37.2%)	18 (23.1%)
2^{nd}	44	57	101	30 (29.7%)	24 (23.8%)
$3^{\rm rd}$	68	35	103	39 (37.9%)	36 (35.0%)
4 th	81	16	97	29 (30.2%)	21 (21.9%)
5 th	0	23	23	10 (43.5%)	5 (21.7%)

^{*} Percentages obtained by dividing values by the value in the Total screened column.

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Table 2

Types and Frequencies of Traumatic Events Endorsed (N=138)

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Rank	Type of Traumatic Event	% Endorsing Event
1.	Witnessed/know of family member arrested or deported	28.3
2.	Witnessed physical violence	21.7
3.	Witnessed or heard about neighborhood or school violence	21.0
4.	Victim of physical violence	17.4
5.	Witnessed a serious accident	17.4
6.	Someone close to child very sick or injured	16.7
7.	Separated from caregiver (e.g., hospitalization)	15.9
8.	Serious Illness/hospitalization	15.9
9.	Someone close to child died	15.2
10.	Threatened by someone (violence)	13.8
11.	Been in a serious accident	11.6
12.	Threatened to steal from child	11.6
13.	Attacked by a dog/animal	10.6
14.	Parent/caregiver abusing drugs	8.7
15.	Witnessed someone threatening violence	6.5
16.	Witnessed weapon violence	5.8
17.	Other stressful event	5.1
18.	Homelessness/extreme poverty	4.3
19.	Kidnapped or someone close to child was kidnapped	3.6
20.	Attacked by a gun, knife, or weapon	3.6
21.	Experienced a natural disaster	2.9