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Suicidal Ideation Among 8-Year-Olds Who Are Maltreated and At Risk: Findings From the LONGSCAN Studies

Richard Thompson, Ph.D.
Juvenile Protective Association

Ernestine Briggs, Ph.D.
Duke University Medical Center

Diana J. English, Ph.D.
Office of Children's Administration Research, Seattle

Howard Dubowitz, M.D., M.S.
University of Maryland School of Medicine

Li-Ching Lee, Ph.D., Sc.M.
University of North Carolina at Chapel Hill

Kate Brody, M.S.
San Diego State University

Mark D. Everson, Ph.D.
Wanda M. Hunter, M.P.H.
University of North Carolina at Chapel Hill

Suicidal ideation was examined among 1,051 8-year-old children identified as maltreated or at risk for maltreatment. Of these children, 9.9% reported suicidal ideation. Many variables, including maltreatment, had bivariate associations with suicidal ideation. Severity of physical abuse, chronicity of maltreatment, and the presence of multiple types of maltreatment strongly predicted suicidal ideation. In multivariate analyses of the domains of proximity, only ethnic background remained significant among demographic variables, only witnessed violence and maltreatment remained significant among family or contextual variables, and only child psychological distress, substance use, and poor social problem solving remained significant among child variables. The effects of ethnicity, maltreatment, and witnessed violence on suicidal ideation were mediated by child functioning. There were few interactions between maltreatment and other factors to predict suicidal ideation. Children who are maltreated and those exposed to community and domestic violence are at increased risk of suicidal ideation, even by age 8.

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Although suicide is the third leading cause of death among 10- to 14-year olds, it remains a rare event, with a rate of about 1.6 per 100,000 (Anderson, 2002). As adolescents age, the rate climbs steadily, and 15- to 19-year-olds are 10 times more likely to end their lives by

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suicide than 10- to 14-year-olds. Conversely, children younger than age 10 years are at very low risk for suicide (0.05 per 100,000); suicides have, however, been reported in children as young as age 5 years. Youth suicide has recently been labeled an American public health crisis (U.S. Public Health Service, 1999). Understanding the risk factors for suicidal ideation in children and young adolescents is important for the development of timely interventions.

Maltreated children are frequently identified as a group at elevated risk for suicidality (Finzi et al., 2001), and this risk may extend into adulthood (Dube et al., 2001). The interaction of maltreatment with other factors in predicting suicidality is not known, however, and the relationship between suicidality and maltreatment remains poorly understood. One study on adolescents (Kaplan et al., 1999) indicated that the association of maltreatment with suicidality was largely explained by other risk factors, such as family functioning and parent or child psychopathology. This may be an example of a general trend in which factors that are most proximal to child functioning, such as psychological distress or delinquent behavior, tend to be stronger than the effects of more distal factors, such as demographic and family characteristics; however, both distal and proximal factors typically remain significant in multivariate analyses (e.g., Beautrais, Joyce, & Mulder, 1996). The relative importance of proximal and distal factors in predicting suicidality has not been examined systematically in younger children.

With some exceptions (e.g., Finzi et al., 2001; King et al., 2001; Kovacs, Goldstone, & Gatsonis, 1993), most research has focused on suicidality in children older than age 12 years. The few studies that have examined preadolescent children and suicidality have had limited generalizability (e.g., Finzi et al., 2001) or have included younger children as part of a broader range of child ages (King et al., 2001). The limited data available, however, suggest that the factors associated with suicidality in young children are similar to those in adolescents. One of the strongest risk factors is child psychopathology, especially depression (Gould, King, et al., 1998); indeed, improved detection of childhood depression is often seen as one of the best ways to reduce child suicide (Flisher, 1999). Aggressive and delinquent behavior are also risk factors (Gould, Greenberg, Velting, & Shaffer, 2003), as is substance abuse (King et al., 2001). Other risk factors for suicidal ideation include demographic characteristics such as White ethnicity (Gould, Fisher, Parides, Flory, & Shaffer, 1996) and being female (Gould, King, et al., 1998), as well as contextual factors such as parental psychopathology (Beautrais et al., 1996), parent domestic violence (Reinherz et al., 1995), life stress (Cohen-Sandler, Berman, & King, 1982), and child maltreatment (Kaplan et al., 1999).

The purpose of the current study was to understand suicidal ideation in a large sample of 8-year-old children identified as having been maltreated or at risk for maltreatment, and to identify the factors associated with suicidal ideation. This simultaneously addressed two populations where suicidality is not well understood: children who are maltreated and at risk for being maltreated, and preadolescent children. Specifically, we (a) estimated the prevalence of suicidal ideation in our sample of children who were maltreated and at risk for maltreatment; (b) explored the association between suicidal ideation and demographic, family and community contextual, and child-functioning variables; and (c) examined the extent to which factors associated with suicidal ideation differ between children who were maltreated and nonmaltreated.

METHOD

A detailed description of the methods used in the Longitudinal Studies on Child Abuse and Neglect (LONGSCAN) has been presented elsewhere (Runyan et al., 1998). With the exceptions of elements unique to the current analyses, only a brief description of the sample and methods is given.

Sample, Design, and Procedures

LONGSCAN is a consortium of studies operating under common protocols, located at five sites located in different regions of the United States: the South, the East, the Midwest, the Northwest, and the Southwest. The current analysis is based on pooled data from these studies. At each site, a sample of children who had been maltreated or were at risk of maltreatment was recruited when children were 4 years old or younger. The sampling frame used at each site is described in Table 1. Assessments of children and caregivers were conducted at ages 4, 6, and 8. Brief questionnaire packets were mailed to children's teachers to assess functioning in other domains. The analyses reported here focus on data collected at age 8.

With the approval of each site's institutional review board, a protocol of common measures and procedures was implemented across sites. Informed consent was obtained from caregivers. Children and caregivers participated separately in interviews administered by trained interviewers that included measures of demographics, parental and family func-

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TABLE 1: Description of the Sampling at Each LONGSCAN Site

Site	N *(% of current sample)*	*Sampling Frame*
Eastern	233 (22.2%)	High risk (Failure to thrive children, or mothers at high risk for HIV infection, or low-income families)
Midwest	161 (15.3%)	CPS-identified maltreated children and neighborhood controls
Southern	183 (17.4%)	High risk (young mothers, single parents, low birth weight, poverty) and matched controls
Southwest	259 (24.6%)	Maltreated children who had been placed in foster care
Northwest	215 (20.5%)	CPS-identified maltreated children

NOTE: CPS = Child Protective Services.

TABLE 2: Descriptive Statistics for the Sample

Variable Name	N *Valid*	*Proportion or* M *(*SD*)*
Demographics		
Child sex (% Female)	1051	52.4%
Child ethnicity	1051	
African American		26.2%
White		55.1%
Other		18.7%
Caregiver marital status	1039	
Never married		41.5%
Married		34.3%
Formerly married		23.6%
Family income (% less than U.S. $25,000)	1020	65.9%
Currently in foster care	1041	6.1%
Family or community context		
Caregiver psychological distress (BSI)	1032	0.34 (0.42)
Caregiver substance-use problem	1034	7.8%
Caregiver mental health care needs	1029	22.0%
Caregiver involvement in school	685	5.10 (2.40)
MFF caregiver support (average)	967	44.16 (7.31)
CTS intimate partner violence	646	0.15 (1.10)
SFI cohesion	1028	2.21 (.67)
SFI conflict	1028	1.69 (.61)
Maltreatment	1051	57.4%
Negative life events	1040	1.12 (1.18)
Witnessed violence	1051	14.32 (9.38)
Transitions in living situation	1039	0.58 (1.12)
Child functioning		
TSCC psychological distress	1042	41.64 (25.32)
CBCL externalizing	1035	12.51 (9.15)
Child substance use	1048	21.0%
Child needed mental health services	1032	32.1%
Child used medical services	1031	19.3%
School suspensions	535	0.17 (0.92)
Teacher-rated academic performance	547	253.65 (86.86)
BIS prosocial	1037	60.86 (22.99)
MFF peer support	894	39.69 (11.42)

NOTE: BIS = Behavioral Intent Scale; MFF = My Friends and Family; CTS = Conflict Tactics Scale; SFI = Self-Report Family Inventory; TSCC = Trauma Symptom Checklist; CBCL = Child Behavior Checklist.

tioning, life events and other contextual variables, and child functioning. Families were compensated financially for their participation.

Additional inclusion criteria for these analyses included having completed the assessment of suicidal ideation at age 8, and having had maltreatment records reviewed through age 8. This resulted in a sample size of 1,051, of the 1,136 who had completed an age 8 interview (92.5%). There were no significant differences in demographic or other variables between those who met these inclusion criteria and those who did not.

Table 2 presents descriptive data on the sample, as well as the number of cases that had valid data for each variable. The sample was almost equally split between boys and girls. A little more than one half of the children were White and about one fourth were African American. Roughly two thirds of the sample had annual family incomes less than U.S. $25,000. Thus, children in the study were more likely to be poor and less likely to be White than children in the general population.

Variables and Their Measurement

Child suicidal ideation and psychological distress. Suicidal ideation was defined as endorsement of the item "Wanting to kill yourself," from the Trauma Symptom Checklist for Children (TSCC; Briere, 1996), which was completed by the child. The response set on the TSCC is presented as a 4-point Likert-type scale; however, for these analyses, this item was scored as absent (*never*) or present (*sometimes*, *lots of the time*, or *almost all the time*). The remaining items on the TSCC, which assess symptoms of depressed mood, anger, anxiety, dissociation, and posttraumatic stress were used to assess child psychological distress. The sum of the items (minus the suicidal ideation item) was calculated to produce a total psychological distress score.

Demographic factors. The caregiver interview included assessment of child age, child gender, child ethnicity, caregiver marital status, family income, and out-of-home placement.

Caregiver psychological distress. Caregiver psychological distress was assessed using the global severity index of the Brief Symptom Inventory (BSI; Derogatis, 1993), a 53-item scale assessing psychological symptomatology that is valid and strongly related with other indices of psychological distress (Derogatis,

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1993). The total raw score on the BSI was used in all analyses.

Caregiver substance-use problems. Caregivers were asked whether and how frequently (twice a month or fewer, 3 to 5 times a month, more than 5 times a month, or daily) they used illegal drugs, as well as alcohol and cigarettes (Hunter et al., 2003). *Substance-use problems* was defined as currently using illegal drugs, or using alcohol at least daily.

Caregiver and child mental health needs and child use of medical services. Caregivers were asked, "Do you feel you needed counseling or therapy for any reason during the past year?" (Hunter et al., 2003). Affirmative responses were coded as indicating mental health needs. Caregivers were asked a similar item regarding children's need for mental health services and whether their children had used medical services in the past year (Hunter et al., 2003). Reliability data is not available for these measures but correlate in expected ways with other measures (Thompson, in press).

Caregiver involvement in school, school suspensions, and school performance. Two teacher-report items assessing caregiver involvement in school were summed to produce a total caregiver involvement score (Hunter et al., 2003). Teachers also reported the number of days the child had been suspended from school (Hunter et al., 2003) and rated the child's academic performance on a scale from 100 to 500 (Achenbach, 1991b). The reliability and validity of teacher ratings of child academic performance have been extensively demonstrated (Achenbach, 1991b). The validity of the caregiver involvement and child suspensions indices has also been established (Hunter et al., 2003)

Caregiver and peer social support. Social support from caregivers and peers was measured using the My Family and Friends scale (MFF; Reid & Landesman, 1986). The MFF is an interview instrument in which the child is asked about people in his or her social network and rates satisfaction with support received from each of them; it has high test-retest and internal consistency reliability (Reid, Landesman, Treder, & Jaccard, 1989) and adequate validity (Hunter et al., 2003). The Emotional Support subscale of the MFF was used. Each person in the child's social network received a summed rating of perceived emotional supportiveness ranging from 0 to 50. Caregiver support was calculated by producing the mean of the support perceived from mother figure and from father figure. Peer social support was calculated using the mean of the support perceived from children who were not siblings.

Intimate partner violence. Domestic violence was assessed using the Conflict Tactics Scale (CTS; Straus & Gelles, 1986) for partners (Couple Form R), a widely used and validated measure of domestic violence, which was completed by caregivers. The Physical Aggression scale was used, which assesses the degree to which the caregiver's partner used physical violence in dealing with conflict.

Family cohesion and conflict. Family cohesion and conflict were assessed using the Self-Report Family Inventory (SFI; Beavers, Hampson, & Hulgus, 1990). The SFI is a 36-item assessment of functioning in five domains of family functioning. It has good reliability and correlates predictably to other indices of family functioning (Beavers et al., 1990). The current study included two subscales, Family Conflict and Cohesion. To avoid the effects of missing data, the scores used in these analyses are item means for both subscales.

Maltreatment. Investigators at the five sites reviewed child protective services data to determine the presence and nature of allegations of maltreatment on children in their samples. For the current analyses, maltreatment allegations were limited to those that occurred before the target child was age 8 years. Children were assigned a dichotomous code, based on whether maltreatment allegations had occurred. Maltreatment allegations were then coded for type (physical abuse, sexual abuse, failure to provide, lack of supervision, and emotional maltreatment) and severity of maltreatment, using the Modified Maltreatment Classification System (MMCS; a LONGSCAN-modified version of Barnett, Manly, & Cicchetti, 1993). The maximum severity of each type of maltreatment was coded, as was the presence of more than one type of maltreatment. Finally, maltreatment was coded according to chronicity, based on the recommendations of Hussey et al. (in press).

Life events and transitions in living situation. A structured life events scale, based on Coddington (1972) was used to assess, through parent report, significant events in the child's life in the past year (e.g., "Did child suffer any kind of accident?" "Did child's parent or caregiver divorce?"). The number of negative experiences was summed to produce a frequency of negative life events. The life events scale also included items related to transitions in the child's living situation (separations from or transitions in primary caregiver, residence changes, etc.), which were summed to produce a count of transitions in living situation.

Witnessed violence. An expanded version of the Things I Have Seen and Heard scale (Richters & Mar-

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tinez, 1992) was administered to assess exposure to violence and feelings of safety at home, at school, and in the community. Things I Have Seen and Heard has high test-retest reliability and good validity (Richters & Martinez, 1992). The LONGSCAN version used in the current study added five items to include violence witnessed in the home. Children were asked to endorse the frequency of each item using a visual Likert-type scale.

Externalizing behavior. The Child Behavior Checklist (CBCL; Achenbach, 1991a), a widely validated caregiver report of child behavior problems, was administered. The Externalizing Problems scale, which comprises Delinquent and Aggressive Behavior scales, was used in these analyses.

Child substance use. Children were asked whether they had ever used tobacco, alcohol, or a list of illegal drugs (Hunter et al., 2003). Neither validity nor reliability information is available for these questions. An endorsement of having tried any of these substances was coded as an indicator of child substance use.

Prosocial problem solving. As part of the child interview, an adapted version of the Behavioral Intent Scale (BIS; Slaby & Guerra, 1988) was administered. The child was presented with a hypothetical social scenario (e.g., being threatened by a bully), and asked "What would you do?" *Prosocial problem solving* was defined as a response that fit one of four categories: verbal assertion, compromise, physical assertion, and help seeking. Other possible responses (coded as non-prosocial) included physical or verbal aggression or avoidance. Interrater reliability for this measure is high, and prosocial problem solving is correlated with an understanding of the consequences of social behaviors (Slaby & Guerra, 1988).

Data Analysis

Bivariate maximum-likelihood logistic regression analyses (Hosmer & Lemeshow, 1989) were performed using each demographic, family or context, and child-functioning variable to predict suicidal ideation.

Then, a multivariate logistic regression was conducted to determine the contribution of the statistically significant variables from the bivariate analyses. Specifically, predictors were entered into the multivariate regression in three stages: The first stage contained all significant demographic variables, the second stage contained all significant family or context variables, and the third stage contained all signification child-functioning variables. A fourth supplementary stage was added to account for site; because the five sites had different selection criteria and populations, they differed in a number of important variables, in particular, ethnic background and presence of maltreatment. Thus, controlling for site initially would have overcontrolled for these variables. However, it was important to know whether additional variance was accounted for by site beyond that explained by demographics and maltreatment. Consequently, a fourth block containing site was entered after the other three stages. Because their inclusion would have reduced the sample size dramatically, variables obtained from teacher reports were not included in the multivariate model, even though they had been included in the bivariate analyses.

Finally, to examine the effect of maltreatment on other bivariate relationships with suicidal ideation, maximum-likelihood logistic regression analyses were conducted examining the interaction between the occurrence of maltreatment and the other variables to predict suicidal ideation.

RESULTS

Descriptive Statistics and Prevalence of Suicidal Ideation

With the exception of the variables obtained from teacher reports, and the measure of intimate partner violence (only assessed in caregivers who were married or cohabiting), each variable had data from at least 90% of the sample. The prevalence of suicidal ideation was 9.9% (104 of 1,051 participants). Specifically, 5.1% (54) reported experiencing suicidal ideation sometimes, 1.8% (19) reported experiencing suicidal ideation lots of the time, and 2.9% (31) reported experiencing suicidal ideation almost all of the time.

Bivariate Associations With Suicidal Ideation

The bivariate associations between suicidal ideation and demographic, family or context, and child-functioning variables are presented in Table 3. Demographic variables significantly associated with suicidal ideation included race and caregiver marital status. To be more specific, White children were more likely to report suicidal ideation than African American children. Children whose caregivers were either married or formerly married were more likely to report suicidal ideation than children whose caregivers had never married.

Among family or context variables, several factors were associated with suicidal ideation. Specifically, caregiver mental health needs, poor family cohesion, allegations of maltreatment, child exposure to vio-

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TABLE 3: Bivariate Associations of Demographic, Family, and Child Variables With Suicidal Ideation

	Unadjusted OR (CI)
Demographics	
Child gender (male)	1.27 (.84 - 1.90)
Ethnicity (referent = African American)	
White	2.11 (1.33 - 3.36)*
Other ethnicity	1.25 (.72 - 2.17)
Caregiver marital status (referent = never married)	
Married	1.72 (1.05 - 2.81)*
Formerly married	1.98 (1.17 - 3.35)*
Family income	1.04 (.98 - 1.12)
Child placement (foster home)	.43 (.13 - 1.41)
Family or community context	
Caregiver psychological distress (BSI)	1.40 (.91 - 2.16)
Caregiver substance-use problem	1.24 (.64 - 2.40)
Caregiver mental health needs	1.95 (1.25 - 3.03)*
Caregiver involvement in school	.90 (.81 - 1.00)
MFF caregiver support (5 points)	.96 (.84 - 1.11)
CTS intimate partner violence	1.01 (.90 - 1.15)
SFI family cohesion	1.44 (1.07 - 1.94)*
SFI family conflict	1.28 (.94 - 1.75)
Maltreatment	2.05 (1.31 - 3.21)*
Negative life events	1.07 (.90 - 1.26)
Witnessed violence (10 points)	1.58 (1.31 - 1.93)*
Transitions in living situation	1.17 (1.01 - 1.35)*
Child functioning	
TSCC psychological distress (5 points)	1.23 (1.18 - 1.29)*
CBCL externalizing behavior (5 points)	1.28 (1.16 - 1.42)*
Child substance use	3.85 (2.53 -5.85)*
Needed mental health services	2.12 (1.41 - 3.21)*
Used medical services	1.11 (.67 - 1.84)
School suspensions	1.01 (.76 - 1.34)
Teacher-rated academic performance (10 points)	.68 (.47 - .98)*
BIS prosocial problem solving (10%)	.83 (.77 - .91)*
MFF peer support (5 points)	.99 (.90 - 1.09)

NOTE: OR = odds ratio; CI = 95% confidence interval; MFF = My Friends and Family, CTS = Conflict Tactics Scale, SFI = Self-Report Family Inventory, TSCC = Trauma Symptom Checklist, CBCL = Child Behavior Checklist, BIS = Behavioral Intent Scale.
Points in parentheses indicate the OR associated with an increase by the respective amount of points (e.g., for every 5 points increased CBCL Externalizing score, risk of suicidal ideation increases by 1.28).
*$p < .05$.

lence, and multiple transitions in child's living situation were all significantly associated with an increased likelihood of suicidal ideation.

Most child-functioning variables were associated with suicidal ideation. Specifically, increased psychological distress (on the TSCC), increased externalizing behavior (on the CBCL), substance use, needing mental health services, poor academic performance, and difficulty considering prosocial solutions were all significantly associated with an increased risk of suicidal ideation.

Multivariate Associations With Suicidal Ideation

Table 4 presents the multivariate logistic regression predicting suicidal ideation. In Step 1, all significant demographic predictors of suicidal ideation were entered simultaneously into the model, predicting suicidal ideation. The demographic block of predictors significantly increased the R^2 by 0.03, compared to the intercept-only model. Taking into account other demographic predictors, only ethnicity remained significantly associated with suicidal ideation. As was the case with the bivariate regression, White children were more likely to report suicidal ideation than were African American children.

In Step 2, all the family or context variables that had significant bivariate associations were added simultaneously to the model. This step revealed that the family or context block significantly increased the R^2 by 0.09. When this block was entered as a covariate, the association between ethnicity and suicidal ideation no longer remained significant. Controlling for other family or context variables and for the demographic variables entered in Step 1, only witnessing more violence and having experienced maltreatment were significantly associated with increased likelihood of suicidal ideation.

In Step 3, all of the child-functioning variables with significant bivariate associations with suicidal ideation were added as a block to the model, significantly increasing the R^2 by 0.15. When this block was entered as a covariate, the associations between suicidal ideation and ethnicity, maltreatment, and witnessed violence were no longer significant. When other child-functioning variables and those variables entered in Steps 1 and 2 were taken into account, only elevated psychological distress, child experience with substance use, and difficulties in prosocial problem solving were significantly associated with increased likelihood of suicidal ideation.

To ensure that additional variance was not being explained by site, the multivariate analyses were rerun twice: (a) with site entered after Step 2, and (b) with site entered after Step 3. In both cases, site added negligible variance (change in $R^2 = .008$ and $R^2 = .002$, respectively) and did not improve the prediction of suicidal ideation ($\chi^2(4) = 3.95$, $p = .41$, and $\chi^2(4) = .83$, $p = .93$, respectively). Because of the negligible influence of site beyond that of demographic and family factors, the results presented are with the three-step regression equation.

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TABLE 4: Multivariate Associations of Demographic, Family Context, and Child Functioning Factors with Suicidal Ideation

	Step 1 Demographics	*Step 2 Family/Context*	*Step 3 Child Functioning*
χ^2	(4) = 14.63	(5) = 41.11	(5) = 83.42
Nagelkerke change in R^2	.03	.09	.15
Ethnicity (referent = African American)			
White	.50 (.29 - .84)*	.55 (.32 - .94)*	.62 (.34 - 1.12)
Other ethnicity	.87 (.47 - 1.52)	.75 (.41 - 1.37)	.75 (.39 - 1.51)
Caregiver marital status (Referent = never married)			
Married	1.34 (.76 - 2.34)	1.56 (.89 - 2.76)	1.46 (.79 - 2.68)
Formerly married	1.62 (.91 - 2.86)	1.56 (.87 - 2.81)	1.61 (.86 - 3.01)
Caregiver mental health needs		1.41 (.86 - 2.31)	1.26 (.73 - 2.31)
SFI family cohesion		1.30 (.94 - 1.80)	1.23 (.84 - 1.75)
Maltreatment		1.91 (1.14 - 3.20)*	1.49 (.74 - 2.78)
Witnessed violence (10 points)		1.68 (1.34 - 2.06)*	1.21 (.95 - 1.54)
Transitions in living situation		1.14 (.96 - 1.36)	1.12 (.90 - 1.31)
TSCC psychological distress (5 points)			2.15 (1.72 - 2.69)*
CBCL externalizing behavior (5 points)			1.11 (.93 - 1.27)
Child substance use			1.81 (1.09 - 3.00)*
Needed mental health services			1.14 (.65 - 1.98)
BIS prosocial problem-solving (10%)			.84 (.75 - .93)*

NOTE: OR = odds ratio; CI = 95% confidence interval; SFI = Self-Report Family Inventory; TSCC = Trauma Symptom Checklist; CBCL = Child Behavior Checklist; BIS = Behavioral Intent Scale.
Points in parentheses indicate the OR associated with an increase by the respective amount of points (e.g., for every 5 points increased CBCL Externalizing score, risk of suicidal ideation increases by 1.10).
*$p < .05$.

Interactions With Maltreatment

The bivariate association between maltreatment-explicating variables and suicidal ideation was examined in the subset of children who had been maltreated. The severity of most types of maltreatment (sexual abuse, failure to provide, lack of supervision, and emotional maltreatment) was not significantly associated with suicidal ideation. However, three maltreatment-explicating variables were significantly associated with risk of suicidal ideation: severity of physical abuse, OR = 1.24 (1.04 to 1.48), chronicity of maltreatment, OR = 1.19 (1.02 to 1.39), and the presence of multiple types of maltreatment, OR = 1.81 (1.11 to 2.95).

The degree to which all of the demographic, family or context, and child-functioning variables described above interacted with maltreatment to predict suicidal ideation was investigated. Of all the predictors examined in the current study, only child substance use interacted significantly with maltreatment to predict suicidal ideation, Wald (1) = 5.86, $p < .05$. Post hoc binary logistic regressions examining the association between child substance use and suicidal ideation were examined among children who had been maltreated versus those who had not been maltreated. The association between child substance use and suicidal ideation was significant in the children who were maltreated, main effect OR = 7.77 (3.55 to 17.01), and the children who were nonmaltreated, main effect OR = 2.67 (1.61 to 4.41); however, the magnitude of the association was greater for maltreated children.

DISCUSSION

Approximately 10% of the children in our sample reported suicidal ideation. This is slightly higher than the estimates of 8.2% presented by Gould, King, et al. (1998) and 7.2% reported by Breton, Tousignant, Bergeron, & Berthiaume (2002); this difference is especially notable, given that the other two samples included predominantly older children, where suicidal ideation would be expected to be more likely. This elevation of suicidal ideation likely reflects the preponderance of maltreatment (and risk for maltreatment) in our sample. Compared with children who are at risk, children with experiences of maltreatment are about twice as likely to report suicidal ideation at age 8 years. The responses of the children in our sample raise serious concerns about suicidal ideation in children as young as age 8 years, especially, but not limited to, children who have experienced maltreatment.

Our findings regarding factors associated with likelihood of suicidal ideation were mostly consistent with the extant literature (sampling mostly older children). Before we discuss the specific areas of overlap, some general points should be made. The effects of demographic and family functioning variables

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appeared to be superceded by more proximal ones. This does not imply that more distal factors are not important. Rather, variables that had significantly bivariate, but not multivariate, associations with suicidal ideation, are still important to consider as potential markers of risk. It is likely that child-functioning variables (especially psychological distress, substance use, and social skills deficits) mediate the immediate and cumulative effects of family environment.

Several demographic factors were important. As has been found with samples of older children (Gould, Greenberg, et al., 2003) and adults (Joe & Kaplan, 2001), White children were about twice as likely as African American children to report suicidal ideation. Proposed explanations for this robust ethnic difference in rates of suicidal ideation include the possibility that the distress that leads to suicidal ideation in White children is expressed in other ways in African American children, and the possibility that cultural or religious factors in the African American experience are protective against thoughts of suicide (Knox, Conwell, & Caine, 2004; Thompson, 2004). Neither possibility could be tested in the current sample, and further research is required. The findings on caregiver marital status are consistent with retrospective studies that have found a link between formerly married (occasionally widowed but mostly divorced) caregivers and children's suicidal ideation (e.g., Dube et al., 2001). It is unclear, however, why children in single-parent homes were at reduced risk in the current study, although the fact that this effect was no longer significant in multivariate analyses suggests that effects of marital status were due to primarily ethnic differences in marital status. That there was no difference between boys and girls in risk of suicidal ideation is consistent with the general finding that gender differences in suicidal ideation emerge in mid-adolescence (Kovacs et al., 1993).

With the exception of caregiver-reported need for mental health care, most indicators of caregiver functioning in our sample were not related to children's suicidal ideation. In contrast, family or contextual variables such as poor family cohesion, witnessed violence, and more transitions in living situation, were associated with suicidal ideation, as has been found in previous research (e.g., Dube et al., 2001). Presumably, these experiences are stressful to children and may increase social isolation, especially in children whose families are not adequately nurturing. Also consistent with the literature (e.g., Silverman, Reinherz, & Giaconia, 1996), a history of maltreatment was an important risk factor. Witnessed violence was an especially strong risk factor, even when controlling for other risk factors. Taken together, these findings suggest that children's experiences with violence, either directed at them, or simply witnessed violence, are key risk factors for the development of suicidal ideation.

Most indices of child functioning were associated with suicidal ideation in expected ways. It is also noteworthy that the only three variables significantly associated with suicidal ideation in the final multivariate model were indices of child functioning: psychological distress, substance use, and social problem-solving skills. Suicidality clearly reflects underlying distress; however, the model suggests that poor problem-solving skills are also independently associated with suicidal ideation, as is early experiences with substances. Specifically, children who respond to social conflicts with anger, aggression, or avoidance rather than more constructive means are more likely to report suicidal thoughts. This may reflect poor coping ability overall or chronically conflictual relationships. The bivariate analyses indicate that children who had tried substances were almost 4 times as likely to report suicidal ideation, consistent with research in older children suggesting substance use is a marker for suicide risk (Garrison, McKeown, Valois, & Vincent, 1993). Our finding that this effect was especially strong among children who were maltreated suggests that substance use at this age may be, in part, an attempt at coping with the negative affect associated with such experiences. Other research has demonstrated a link between maltreatment and substance use (Bensley, Spieker, Van Eenwyk, & Schoder, 1999). As well, it is important to note that although the rate of substance use in the sample seemed high (21%), Bensley et al. (1999) found that more than 30% of children experiment with drugs by the age of 10 years. Finally, caregivers' perceptions of mental health needs were associated with suicidal ideation, suggesting that caregivers are often aware that something is wrong, even if they do not know the exact nature of the problem (Velez & Cohen, 1988).

As has been found in other studies, a history of maltreatment has a significant association with suicidal ideation. Unlike other research, (e.g., Kaplan et al., 1999), this was not simply because of its co-occurrence with other risk factors, although the effect of maltreatment appeared to be mediated by child functioning. Consistent with other research (Beautrais et al., 1996), the severity of physical abuse, in particular, and the presence of multiple types of maltreatment were associated with suicidal ideation. Other studies have found a link between sexual abuse and suicidality (Beautrais et al., 1996); however, these were conducted with older children, and our sample may either have had less opportunity for exposure to sex-

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ual abuse or the effects of sexual abuse may take longer to develop. Chronicity of maltreatment is increasingly acknowledged as important; the effects of maltreatment may be cumulative and children's developmental competence progressively declines with continued maltreatment (Coster, Beeghly, Gersten, & Cicchetti, 1989; Egeland, Sroufe, & Erickson, 1983). These findings, taken together, highlight the importance that maltreatment and other family environment factors play; even if their effects are largely explained by child functioning, it is likely that child functioning is, in part, a mediator for these effects, and child functioning and suicidal ideation are influenced by family environment.

The current study found an association between suicidal ideation and childhood trauma, specifically child maltreatment and witnessed violence. These effects of trauma are especially robust, as they survived in the multivariate analysis. Trauma is often thought of as a risk factor for suicide, even independent of its impact on psychopathology (Goldsmith, Pellmar, Kleinman, Bunney, and CPPAAS, 2002). A number of mechanisms by which trauma might lead to suicide have been proposed; yet understanding of this association has been hampered by the lack of longitudinal, developmentally oriented research (Goldsmith et al., 2002). The LONGSCAN sample, which should be followed into adulthood, provides a unique opportunity to understand the development of a predisposition to suicide, the impact childhood trauma has on such risk, and the points at which intervention might reduce risk in children who are exposed to trauma.

Our study has several limitations. First, the data analyzed here are cross-sectional, precluding conclusions about causal relations. Second, our sample is derived from high-risk populations and includes a high number of maltreated children. As a result, generalizability to the broader population of 8-year-olds is limited. It should be noted, however, that the markers of suicidality appeared similar in children who were maltreated and those who had not been identified as such, suggesting that such markers may be somewhat generalizable to similar other children who are high risk. On a related note, the use of official documentation of child maltreatment has strengths and limitations, as does our use of allegations of maltreatment, rather than substantiated maltreatment. However, restricting maltreatment to substantiated maltreatment only may have reduced sensitivity to maltreatment, and there is evidence that alleged maltreatment is at least as strongly associated with child outcomes as is substantiated maltreatment (Drake, 1996; Hussey et al., in press).

Another important issue is the possibility of family-wise error, in the number bivariate analyses that were conducted. Certainly, given the large number of analyses conducted, the chance for such errors is high. However, a more stringent standard for significance would also increase the risk of Type II error. Given the exploratory nature of the analyses, and the dearth of knowledge about correlates of suicidal ideation in children of this age, it seemed more important to identify possible correlates than to eliminate them. Thus, the results of our bivariate analyses should be seen as provisional and should be replicated in other studies. In the multivariate analyses, family-wise error was adjusted as other possible correlates were included in the model, so these results are likely more robust.

Finally, we used a single item from a standardized self-report measure (wanting to kill yourself) to indicate suicidal ideation. Although our assessment has face validity and, as our analysis indicates, substantial construct validity, future researchers might consider a more detailed, comprehensive assessment of suicidal ideation. Single-item assessments of suicidal ideation are very common in the literature; both of the other estimates of prevalence cited here are based on single-item assessments (Breton et al., 2002; Gould, King, et al., 1998), albeit from an interview. Finally, it is important to note that failure to report suicidal ideation, especially on a single item, does not mean that it is not present; in some cases, suicidal children may fail to disclose ideation (Carlton & Deane, 2000). On the other hand, reported suicidal ideation may not indicate an imminent risk of suicide, although it probably does indicate a high level of psychological distress, likely requiring intervention (Pirkis, Burgess, Meadows, & Dunt, 2001).

These findings suggest that self-reported thoughts of suicide are a relatively common phenomenon among young children who are maltreated or at risk for maltreatment. The factors associated in bivariate analyses with suicidal ideation in 8-year-old children appear similar to those in adolescents (Gould, Greenberg, et al., 2003). They include substance use, school discipline problems, externalizing behavior, poor social skills, frequent family moves or changes in caregiver, and low levels of family cohesion. More than appears to be the case with older children, contextual and family factors appear to exert their effects primarily through their impact on proximal child functioning variables. In particular, clinicians should be alert to the potent risk factors of psychological distress and limited social problem-solving skills in signaling the need for further assessment and possible intervention. Professionals working with children,

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especially children who exhibit one or more risk factors, should routinely screen for suicidal ideation.

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Richard Thompson, Ph.D., is director of research at the Juvenile Protective Association and assistant professor in the Department of Psychiatry at the University of Illinois at Chicago. He is the principal investigator for the Midwest site of LONGSCAN. He received his Ph.D. in clinical psychology from McGill University in 2000 and did postgraduate work at the University of Pennsylvania. He has authored more than 25 peer-reviewed journal articles on suicide, the assessment of psychopathology, access to mental health services, and the relationship between family interactions and mental health.

Ernestine Briggs, Ph.D. is a faculty member in the Department of Psychiatry and the Behavioral Sciences at Duke University Medical Center. She is also director of the Trauma Treatment and Research Program at the Center for Child and Family Health-NC and a coinvestigator at the Coordinating Center of LONGSCAN. Her research and clinical interests include child maltreatment, domestic violence, traumatic stress, and anxiety disorders.

Diana J. English, Ph.D., is the director of research for the Child Welfare League of America. For the past 17 years, she has been the chief of research for the Children's Administration, Washington State Department of Social and Health Services. For the past 12 years, she has been the principal investigator for the Northwest site of LONGSCAN.

Howard Dubowitz, M.D., M.S., is professor of pediatrics and codirector of the Center for Families at the University of Maryland, Baltimore. He is on the Executive Board of the International Society for Prevention of Child Abuse and Neglect and the Maryland State Council on Child Abuse and Neglect. He served two terms on the Board of the American Professional Society on Child Abuse and Neglect and has chaired the Committee on Child Maltreatment, American Academy of Pediatrics, Maryland Chapter. He is a clinician, researcher, and educator, and is active in the policy arena at the state and national levels.

Li-Ching Lee, Ph.D., Sc.M., is an assistant scientist at the Department of Epidemiology, Johns Hopkins Bloomberg School of Public Health. Before her faculty appointment with Hopkins, she worked as data manager for the Southern site of LONGSCAN.

Kate Brody, M.S., is a doctoral student at the San Diego State University/ University of California-San Diego Joint Doctoral Program in clinical psychology. She received her B.A. from Wellesley College in 1999 and her M.S. from San Diego State University in May 2004. She is the coordinator for the southwest site of LONGSCAN and expects to complete her doctoral work in May 2006.

Mark D. Everson, Ph.D., is professor and director of the Program on Childhood Trauma and Maltreatment within the University of North Carolina Department of Psychiatry, an outpatient clinical program specializing in the assessment and treatment of children and adolescents who are abused, neglected, and psychologically traumatized. He is coinvestigator of the Coordinating Center of LONGSCAN. His research and clinical interests include child forensic interviewing, the assessment of allegations of child physical and sexual abuse, and the treatment of child and adolescent victims of maltreatment.

Wanda M. Hunter, M.P.H., is an adjunct associate professor in the Department of Social Medicine at the University of North Carolina at Chapel Hill. During the first 10 years of LONGSCAN data collection, she was a coprincipal investigator of the Coordinating Center of LONGSCAN.

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