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Short communication

Life stress, early maltreatment, and prospective associations with depression and anxiety in preadolescent children: A six-year, multi-wave study

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ABSTRACT

Background: The relationship between life stress and depression and anxiety is well characterized in adolescents and adults. Further, research has shown that adolescents and adults with a history of childhood maltreatment are more likely to develop depression and anxiety after being exposed to stress than those without this history. However, the processes underlying risk for depression and anxiety in maltreated preadolescent children are unclear. The current study sought to identify these processes in at-risk preadolescents.

Methods: This study analyzed data from the Longitudinal Studies of Child Abuse and Neglect and evaluated interpersonal and non-interpersonal life stress as predictors of depression and anxiety specifically, and internalizing symptoms more generally, in a sample of children vulnerable or exposed to maltreatment (n = 1,049). Participants were assessed repeatedly over a six-year period of early-to-mid childhood.

Results: Interpersonal life stress prospectively predicted greater depression and anxiety, but not general internalizing symptoms after emotional and behavioral problems, as well as child's sex, family income and baseline maternal depressive symptoms, were covaried. Non-interpersonal life stress was not prospectively predictive of depression and anxiety or general internalizing symptoms.

Limitations: The study was unable to identify specific types of interpersonal stress most relevant to risk for depression and anxiety in preadolescent children.

Conclusions: These findings lend support for the importance of interpersonal stress when screening for risk for depression and anxiety among preadolescent children vulnerable or exposed to maltreatment. Early intervention to decrease the occurrence and impact of these stressors could have long-lasting impacts on this vulnerable population.

Introduction

A history of childhood maltreatment is a significant risk factor for negative mental health outcomes, including depression and anxiety (Teicher et al., 2010). However, not all maltreated individuals experience these outcomes. Understanding the processes underlying risk in individuals vulnerable to or who have experienced childhood maltreatment is important for identifying those who are at particular risk for depression and anxiety in this population, and for determining meaningful targets for preventive intervention. Life stress is a promising candidate for investigation within this context. Not only is life stress a major risk factor for depression and anxiety, but individuals who have experienced childhood maltreatment are particularly sensitized to its pathogenic effect (McLaughlin et al., 2010). Indeed, studies with adolescents (McLaughlin et al., 2010) and adults (Harkness et al., 2006) have found that those with a history of childhood adversity including maltreatment were more likely to develop depression and anxiety than were those with no such history when exposed to recent stressors.

Although life stress has been studied in adolescents and adults with childhood maltreatment, its relationship to depression and anxiety has not been characterized in preadolescents vulnerable to or exposed to maltreatment. Addressing this gap in the literature is especially important because early onset of depression and anxiety is associated with a particularly negative course (Alpert et al., 1999). Also in need of clarification are the specific types of life stress involved in risk for these outcomes, an important consideration given evidence that interpersonal stress has been particularly implicated in the broader literature (Hammen, 2005).

The current study sought to address these gaps in the literature by utilizing a six-year, multi-wave design examining interpersonal and

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non-interpersonal stress as predictors of preadolescent depression and anxiety specifically, in a diverse sample with elevated representation and risk of childhood maltreatment. We also conducted secondary analyses with interpersonal and non-interpersonal stress predicting internalizing psychopathology more broadly. Of the aforementioned two forms of life stress, we hypothesized that interpersonal stress in particular would prospectively predict depression and anxiety. Finally, in employing a multi-wave design, the current study is in a uniquely advantageous position to adopt an idiographic rather than nomothetic approach, evaluating whether within-person differences rather than between-person differences in stress exposure confers risk for these negative mental health outcomes. This is important given the theoretical position that relative increases rather than absolute levels of life stress are central to risk for internalizing psychopathology (Abela et al., 2006).

Methods

Participants

The current study was conducted with data from the Longitudinal Studies of Child Abuse and Neglect (LONGSCAN), a publicly available, de-identified dataset (Runyan et al., 2011). LONGSCAN was conducted from 1991 to 2011 with a racially and ethnically diverse sample vulnerable or exposed to childhood maltreatment, drawn from five sites across the United States, starting at infancy at one site and age 4 at the others, with all sites collecting data through age 18. The present study utilized data from all sites (n = 1,049), with a focus on data from ages 6 through 12 due to the availability of variables of interest and our interest in depression and anxiety in preadolescence. Additional information regarding the LONGSCAN sample and design have been previously reported (Runyan et al., 1998).

Measures

Child psychopathology. *Child Behavior Checklist* (CBCL; Achenbach, 1991). The CBCL is a caregiver-reported assessment of a child's maladaptive behavioral and emotional problems. Subscales derived from the CBCL and used in the present study were general internalizing psychopathology, anxiety and depression, social withdrawal, somatic complaints, delinquent behavior, attention problems and aggressive behavior (α for all subscales across waves = 0.62 – 0.91).

Child life stress. The *Child's Life Events Checklist* (CLEC) is a checklist of past-year life events with additional events added to reflect low-income samples and childhood exposure to violent events. Given the focus of the present study on life stress, only the 20 negative life events were retained. These negative events were coded by two independent raters as either interpersonal (n = 10) or non-interpersonal (n = 10) (κ = 0.80).

Baseline maternal depressive symptoms. The *Center for Epidemiological Studies - Depression Scale* (CES-D; Radloff, 1977) is a 20-item self-report measure which assesses past-week depressive symptoms. Internal consistency was high (α = 0.87).

Annual family income. Respondents chose one of 11 categories to best describe their family income, which was then dichotomized such that family income of $19,999 or less was coded 0, and family income of $20,000 or more was coded 1.

Procedure

Maternal caregivers were administered the CES-D at baseline, their child's age-six assessment. The CBCL was administered every two years from age six through 12, and the CLEC assessing past-year life stress was given every year from age six through 12.

Data Analysis

Hierarchical linear modeling (HLM; HLM program version 7.0.0) was performed to evaluate between-person differences and within-person changes in general internalizing psychopathology, as well as depression and anxiety, and their respective predictors over time, as HLM accounts for dependency in observations in data that are nested in structure. For our primary analysis of depression and anxiety as the outcome, interpersonal and non-interpersonal stress were evaluated as within-person predictors; social withdrawal, somatic complaints, delinquent behavior, attention problems, and aggressive behavior as within-person covariates; and family income, baseline maternal depression and child sex as between-person covariates. This analysis was repeated for general internalizing psychopathology as a secondary outcome and with social withdrawal and somatic complaints removed as within-person covariates as these two latter variables are included in the outcome variable. Within-person predictors/covariates were group-mean centered and between-person covariates were grand-mean centered, except dichotomous variables (i.e., sex), which were left uncentered. This idiographic approach minimized the influence of individual differences by operationalizing an individual's life stress at a given time in relationship to the individual's mean life stress. This analysis was time-lagged, in that interpersonal and non-interpersonal stress at $Time_{(n-2)}$ and $Time_{(n-1)}$ were summed to ensure no temporal gap in these variables in predicting anxiety and depression at the next available time-point CBCL data were collected ($Time_n$). Estimates are from population-average models using robust SEs from restricted maximum likelihood estimation.

Results

Sample descriptives are presented in Table 1. At baseline, participants were 51.95% female (mean age = 5.97 years old; SD = 0.60). The sample was also diverse, with a racial/ethnic composition of 54.44% black, 27.07% white, 6.95% Hispanic, and 11.55% other.

Table 1
Sample characteristics (n = 1,094).

	% or mean (SD)
Child Demographics	
Sex (female)	51.95%
Age	5.97 (0.60)
Race	
White	27.07%
Black	54.44%
Hispanic	6.95%
Native American	0.31%
Asian	0.10%
Mixed race	10.32%
Other	0.82%
Caregiver Demographics	
Age	34.91 (10.54)
Baseline Maternal Depressive Symptoms	12.00 (10.53)
Race	
White	32.70%
Black	54.81%
Hispanic	7.44%
Native American	0.48%
Asian	0.29%
Mixed race	2.76%
Other	1.53%
Annual income	
< $5,000	12.77%
$5,000 – 9,999	21.07%
$10,000 – 19,999	31.94%
$20,000 – 29,999	13.44%
$30,000 – 39,999	9.54%
$40,000 – 49,999	5.44%
>$50,000	5.82%

Table 2
Multivariate hierarchic linear model of predictors of depression and anxiety and general internalizing psychopathology.

Predictors	Coefficient	SE	*t*	*p*
Depression and Anxiety				
Within-Person				
Social Withdrawal	-.07	.06	-1.25	.21
Somatic Complaints	-.08	.07	-1.19	.23
Attention Problems	-.08	.05	-1.75	.08
Delinquent Behaviors	-.03	.06	-.53	.59
Aggressive Behaviors	-.001	.03	-.04	.97
Interpersonal Life Events	.15	.07	2.28	.023
Non-Interpersonal Life Events	-.04	.06	-.59	.56
Between-Person				
Child Sex (Female)	-.34	.21	-1.59	.11
Maternal Depressive Symptoms	.08	.01	7.16	<.001
Annual Family Income	.60	.23	2.64	<.01
Internalizing Psychopathology				
Within-Person				
Attention Problems	-.16	.07	-2.11	.04
Delinquent Behaviors	-.01	.10	-.05	.96
Aggressive Behaviors	-.08	.05	-1,58	.11
Interpersonal Life Events	.17	.12	.145	.15
Non-Interpersonal Life Events	-.003	.11	-.03	.98
Between-Person				
Child Sex (Female)	-.34	.36	-.93	.35
Maternal Depressive Symptoms	.14	.02	7.19	<.001
Annual Family Income	.85	.39	2.21	.03

Primary maternal caregivers at baseline were an average of 34.91 years old (*SD* = 10.54 years). They were 54.81% black, 32.70% white, 7.44% Hispanic, and 5.06% other. Participants in the sample were generally drawn from low-income households, with approximately two-thirds of the families making less than $20,000 per year in 1991 US dollars.

Results of the HLM analyses are presented in Table 2. After covarying concurrent emotional and behavioral problems, as well as family income, sex and baseline maternal depressive symptoms, we found interpersonal life stress prospectively predicted greater child depression and anxiety (β = .15, p =.023, $r_{effect\ size}$ = .05). Further, non-interpersonal stress was not prospectively associated with depression and anxiety (β = -.035, *ns*, $r_{effect\ size}$ = .03). Among the covariates, both family income (β = .60, p < .01) and baseline maternal depressive symptom severity (β = .08, p < .001) were prospectively predictive of greater child depression and anxiety.

After concurrent emotional and behavioral problems were covaried, interpersonal life stress did not predict internalizing psychopathology (β = 0.17, *ns*, $r_{effect\ size}$ = .03). Non-interpersonal stress similarly did not predict internalizing psychopathology (β < .01, *ns*, $r_{effect\ size}$ < .01). Among the covariates, both family income (β = .85, p =.03) and baseline maternal depressive symptom severity (β = .14, p < .001) prospectively predicted greater child internalizing psychopathology.

Discussion

By utilizing a six-year, multi-wave longitudinal design, the current study provided a sensitive, idiographic evaluation of the temporal relationship between within-person levels of life stress and prospective depression and anxiety (and general internalizing psychopathology) in an at-risk sample over the course of preadolescence. We found robust support for a prospective association between life stress and depression and anxiety symptoms throughout preadolescence, even after accounting for other forms of psychopathology, family income and maternal depression.

Furthermore, there appeared to be specificity in the type of stressors conferring risk, with interpersonal, but not non-interpersonal, life stress being predictive of depression and anxiety. This is consistent with the broader literature in older age groups, which have found interpersonal stress to be particularly pathogenic (Hammen, 2005). This finding is also notable when considering that preadolescence is a critical developmental period hypothesized to be especially sensitive to interpersonal influences on the development of chronic risk for these negative mental health outcomes. Indeed, according to cognitive theories of depression (Rose and Abramson, 1992), cognitive vulnerability for this disorder develops after repeated exposure to interpersonal stressors that convey negative implications about the individual (e.g., criticism from parents), and this cognitive vulnerability is hypothesized to develop during early and middle childhood, when self-schemata are still relatively malleable.

In our secondary analysis, there was a lack of evidence for a prospective association between life stress – both interpersonal and non-interpersonal stressors – and general internalizing psychopathology. When considered together with our finding of a positive association with depression and anxiety, the current findings suggest that the pathogenic effect of interpersonal stressors may be specific to depression and anxiety rather than internalizing psychopathology more generally. Given that the internalizing symptom scale differed from the depression and anxiety scale in the inclusion of somatic symptoms and withdrawal, it may be that interpersonal stressors may be less relevant to the occurrence of these latter two aspects of internalizing psychopathology in this age group.

The current study is not without its limitations. Although a unique strength of the study was its utilization of a measure of life stress specifically tailored to the population of interest (i.e., events were added that reflected experiences more common in low-income populations and those with greater risk for exposure to violent events), additional specificity in the life stress measure would offer added value. That is, future research should clarify the specific types of interpersonal stress most relevant to risk for depression and anxiety in preadolescent children, as there are likely developmental differences in types of stressors relevant to risk. Specifically, the nature of the other individuals involved in these interpersonal stressors may be of particular importance. For example, interpersonal stressors involving parents may be especially pertinent to risk for depression and anxiety in preadolescence, given the greater importance of parent figures at this age (Choudhury et al., 2006), whereas interpersonal stressors involving peers may become increasingly important and relevant to risk in adolescence (Somerville, 2013). Long-term longitudinal research extending assessments of parental and peer-related interpersonal stressors from childhood into adolescence is required to fully evaluate this possibility. To the extent that this distinction between parental and peer-related interpersonal stressors in early childhood and adolescence is empirically supported, it may provide guidance for age-specific tailoring preventive intervention approaches for addressing risk for depression and anxiety in youth.

Additionally, it should be noted that the current study used the CBCL to assess depression and anxiety symptoms. Although this measure is a widely used clinical tool, it is important to note that it is not diagnostic, and so caution should be taken in generalizing the current findings to syndromal presentations of depression and anxiety. It would therefore be important for future research on this topic to utilize diagnostic measures of these disorders.

The findings of this study have important clinical implications. The current findings lend support for the importance of interpersonal stress when screening at-risk preadolescents. It is important to note that some of the most common interpersonal stressors (e.g., interpersonal conflicts), unlike many non-interpersonal stressors (e.g., parent losing a job and health problems), are modifiable risk factors and thus preventable. Early intervention to decrease the occurrence of these interpersonal stressors could have long-lasting benefits in reducing risk for depression and anxiety in a particularly vulnerable population.

Contributors

Ms. Levin and Dr. Liu conceptualized and designed the study,

conducted the analyses, drafted the initial manuscript, and reviewed and revised the manuscript. Both authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

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Declaration of Competing Interest

Rachel Y. Levin and Richard T. Liu have no conflicts of interest.

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