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Predicting Children's Depressive Symptoms from Community and Individual Risk Factors

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Abstract

Community, demographic, familial, and personal risk factors of childhood depressive symptoms were examined from an ecological theoretical approach using hierarchical linear modeling. Individual-level data were collected from an ethnically diverse (73% African-American) community sample of 197 children and their parents; community-level data were obtained from the U.S. Census regarding rates of community poverty and unemployment in participants' neighborhoods. Results indicated that high rates of community poverty and unemployment, children's depressive attributional style, and low levels of self-perceived competence predict children's depressive symptoms, even after accounting for demographic and familial risk factors, such as parental education and negative parenting behaviors. The effect of negative parenting

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behaviors on depressive symptoms was partially mediated by personal variables like children's self-perceived competence. Recommendations for future research, intervention and prevention programs are discussed.

Keywords

Depression; Parent–child relations; At-risk populations

Introduction

Risk and resilience researchers have identified several factors that place children at risk for poor academic achievement and conduct problems, including marital discord and divorce, low socioeconomic status (SES) and poverty, parental psychopathology, harsh, negative or poor parenting practices, large family size, lack of maternal education, and negative or stressful life events (Masten 2001; Sameroff et al. 1998). This literature has provided strong support for a cumulative risk model, that is, the more risk factors a child is exposed to, the more likely the child is to develop a negative outcome, such as conduct problems or academic difficulties (e.g., Burchinal et al. 2000; Greenberg et al. 1999; Rutter 1979). Although many studies have focused on the risk for externalizing behaviors, social problems, and academic difficulties, relatively little attention has been given to the same set of factors as possible risks for internalizing problems, like depression (Masten and Curtis 2000). Given the substantial comorbidity between internalizing and externalizing disorders, risk factors for externalizing problems would seem to be likely candidates as risk factors for internalizing problems as well (e.g., Cole and Carpentieri 1990). Drawing from research examining the etiology of depressive symptoms, and using Bronfenbrenner's bio-ecological perspective as a theoretical guide (Bronfenbrenner and Evans 2000), we simultaneously examine community, demographic, familial, and personal risk factors associated with children's depressive symptoms in an ethnically and economically diverse community sample of children and their parents.

Gutman et al. (2003) defined a risk factor as a variable that is positively related to a negative outcome. The study of risk factors for depression is somewhat underdeveloped (Beardslee and Gladstone 2001), with much of the work focusing on children who are considered at risk by virtue of having a parent who is diagnosed with a psychiatric disorder, such as major depressive disorder (e.g., Birmaher et al. 2004; Stein et al. 2000). Although the genetic risk for depression that parents convey to their children is significant, and would be placed at the center of a Bronfenbrenner-type bio-ecological model, additional risk factors for depression that warrant attention include living in poverty, being female, experiencing a severe stressor, and having low self-perceived competence (Institute of Medicine 1994).

In addition to demographic risk factors, like children's gender and maternal education, we focus on risk factors found in children's neighborhoods (e.g., community-level unemployment), in their families (e.g., harsh-negative parenting behaviors), and the child's own personal attributes (e.g., self-perceived competence; see Fig. 1). The most peripheral factors in this model are community and neighborhood influences. More proximal risk

factors to the individual child are familial variables, including parenting behaviors and demographic influences, like mother's education. Still more proximal are the child's cognitions and self-perceptions. At the very center of a bio-ecological model would be the child's outcome (in this case, depression), along with the child's biological and genetic characteristics. In the following sections we expand upon these community and individual-level risk factors and examine them in relation to the literature on the etiology of depressive symptoms.

Community-Level Risk Factors

Living in an economically poor or stressed area is generally associated with negative outcomes for children (McLoyd 1998). Sameroff and colleagues have examined risk factors at different ecological levels and have examined community level variables, like community-level SES and community-level educational attainment, and studied the relation of these community-level variables to children's competence (Furstenberg et al. 1998; Sameroff et al. 1998). They reported that community-level variables significantly impact the development of children's competencies in negative ways. The mechanisms by which community and neighborhood influences, like violence and poverty, can affect children's depression are varied. For instance, these experiences may undermine the child's sense of safety (Fitzpatrick et al. 2005; Greenberg et al. 1999), or decrease a parent's likelihood of engaging in warm, consistent, responsive and authoritative parenting behaviors (Brody et al. 1994). Conger and colleagues (1994, 2002), as well as others (e.g., Spence et al. 2002), have found that the stress associated with economic hardship and poverty is associated with increased risk for the development of children's depressive symptoms.

In a cross-sectional sample of over 1500 inner-city African-American youth from impoverished neighborhoods, Fitzpatrick et al. (2005) examined the relation between exposure to community violence and depressive symptoms. Though familial and personal protective factors buffered children from symptoms of depression, exposure to violence in the community still significantly predicted symptoms of depression, even after accounting for demographic, familial, and personal protective factors. However, a limitation of this important study is that it relied solely on children's self reports. In the current study, both parental and child reports will be utilized in conjunction with data from the U.S. Census.

Individual-Level Risk Factors

At the individual level, we will focus on three board sets of individual-level risk factors that include demographic factors (e.g., maternal education), familial factors (e.g., negative parenting behaviors), and personal factors (e.g., children's depressive attributional style).

Demographic Risk Factors—The demographic variables included in the current study were chosen based on the work of others (e.g., Greenberg et al. 1999; The Institute of Medicine 1994; Sameroff et al. 1998) and include low income, lack of maternal education, large family size, single parenthood status, the child's gender (being a female) and ethnicity (being a minority).

Greenberg and colleagues (1999) found that socio-demographic variables, including children's ethnicity and parental occupation, predicted internalizing behaviors in a longitudinal study of 337 five- to six-year-old children and their parents. In addition, they found that negative parenting behaviors predicted children's internalizing symptoms. Though familial processes and demographic risk factors were predictive of internalizing behavior, personal variables, like self-perceived competence and attributional style, were not assessed in their investigation. Additional measures of familial-processes and children's cognitions would help clarify the relation between socio-demographic factors and depressive symptoms, and help us to better target children and youths who may be at heightened risk for developing depression.

In the current study, we took a cumulative approach to the study of these demographic risk factors (see Burchinal et al. 2000). For each child, we counted the number of demographic risk factors that were present (e.g., parent reported less than a high school education, parent reported being a single parent). This cumulative approach has been recommended for studies in which the sample size-to-variables ratio is relatively small (Burchinal et al. 2000).

Familial Risk Factors—Familial process risk factors examined in the current study include exposure to harsh/negative parenting behaviors, and the experience of negative life events. Other studies suggest that high rates of harsh-negative parenting behaviors are associated with depression in children. Kim and colleagues found that depressed youths were subject to harsher and less consistent parenting, as reported by both the child and parent, compared to youths who were not depressed (Kim et al. 2003). Using data collected as part of the National Longitudinal Survey of Youth, Eamon (2002) found that mothers' use of physical punishment predicted children's depressive symptoms. Finally, in a study of young children and their families, Harrist et al. (1994) reported that children's withdrawn behaviors were related to negative parent–child interactions. The experience of other, more specific, negative stressful life events may increase children's risk for depressive symptoms (Compas 1987). Crean (2004) reported that 12-year-old Latino students who had experienced many stressful life events were less competent and less well adjusted than students who had experienced fewer stressors.

The experience of negative parenting behaviors and stressful life events may serve as a stressor that activates certain depressive thoughts for some individuals (see Abela 2001), and may affect the development of children's depressive symptoms by increasing children's cognitive vulnerability to depression (Ingram 2003). Indeed, in a longitudinal study, Mezulus et al. (2006) found that the childhood experience of negative life events and negative parenting behaviors predicted the development of children's depressive attributional style at age 11 (depressive attributional style is a personal risk variable, see below, robustly associated with depressive symptoms both in children and adults). However, their sample was not particularly diverse, with 92% of the participants being Caucasian and about 70% of parents reported having some college education. In the current study, these findings are extended using an ethnically and economically diverse sample of children and parents.

Personal Risk Factors—Personal risk factors examined in the current study include a depressive attributional style and low levels of self-perceived competence. Research indicates that the nature of individuals' causal attributions for positive and negative life events relates to their motivational and affective behavior (e.g., Abramson and Alloy 1990; Weiner 1979). Research with adults has shown that a depressive attributional style, that is, the tendency to make internal, stable, and global attributions for negative events (and external, unstable, specific attributions for positive events), is associated with depressive symptoms[1] (e.g., Alloy et al. 1999). Children's depressive attributional style also has been shown to be related to symptoms of depression (e.g., Conley et al. 2001; Gladstone and Kaslow 1995).

In addition to children's attributional style, children's self-perceived competence is another personal risk factor of interest in the current study. Research by Cole and colleagues supports a competency based model of childhood depression (Cole 1991; Cole et al. 1997). These studies suggest that children who believe they are competent in multiple developmentally important domains (e.g., athletics, academics, and social relations) are less likely to be depressed, and that changes in self-perceived competency predict changes in symptoms of depression (see Cole 1991; Cole et al. 1997).

Preventive interventions implemented by Pössel and colleagues (2005), with children in the eighth grade, show that students who participated in the intervention designed to enhance their self-competency were buffered from experiencing depressive symptoms in comparison to a control group; the findings were most pronounced with individuals who were initially low in self-efficacy. However, they did not find a reduction of negative cognitions, or depressive attributional style. Perhaps by early adolescence this way of thinking is less malleable than it is in younger children. In a longitudinal study of the stability of children's depressive symptoms, Tram and Cole (2006) found relatively less stability during middle childhood when compared to early adolescence. The greater instability during this time may provide opportunities for researchers to better understand causal pathways (see Cole 2006).

The Current Study

Drawing from the work of others, specifically Fitzpatrick et al. (2005), Greenberg et al. (1999) and Mezulus et al. (2006), the current study expands upon the results of these studies in several important ways. First, we obtained information from multiple informants. In the current study, parents were asked about specific parenting behaviors and practices, whereas children were asked about their depressive symptoms. Also, we included an objective index of community poverty and unemployment, with a range of levels of community poverty represented. Second, the current study takes a risk-factor approach, complimenting Fitzpatrick et al.'s (2005) focus on protective factors. Third, we examined personal attributes of children, including their self-perceived competence and depressive attributional style, in an economically and ethnically diverse sample.

[1]Depressive attributional style per se is the risk factor, which like gender, ethnicity, poverty, etc. is not sufficient to cause depression, but does serve to increase risk. On these grounds, we believe we are justified in treating attributional style per se as a singular risk factor. Furthermore, our analysis of the attributional style by negative life events interaction with this same dataset reveals non-significant results up until age 14.

Our objective is to understand better how risk factors present in multiple contexts of children's environments, specifically within the child's community, family, and the self (see Table 1), simultaneously relate to children's depressive symptoms. Based on the work of others we expect that each set of variables, at each level in our model, will contribute significantly to the prediction of children's depressive symptoms even after controlling for the other risk factors in the model. Specifically we tested the following hypotheses:

Hypothesis 1 Community-level poverty and unemployment will predict individual-level depressive symptoms in children, such that greater poverty and unemployment will be associated with more depressive symptoms.

Hypothesis 2 The presence and accumulation of demographic, familial, and personal risk factors will be associated with more symptoms of depression in children.

Hypothesis 3 Even after accounting for the influence of proximal risks at the demographic, familial, and personal levels, community-level risk factors will still be associated with increased individual-level depressive symptoms in children.

Method

Participants

At the start of the 2002–2003 school year, we recruited participants from five public elementary schools and two public middle schools serving a mid-sized southern city. These specific schools were targeted because they were located in lower and working class neighborhoods. We distributed consent forms to the teachers of all children in the second, fourth, and sixth grades at these schools; the consent forms were then given by the teachers to the children to be brought home to their parents. In total, approximately 1000 consent forms were distributed. We received 660 consent forms, with 526 (80%) parents agreeing to let their children participate. After obtaining parental consent, data collection with the children began at the children's school during times and dates designated by teachers and school administrators. Complete data were collected from 425 students. Reasons for incomplete student data include absences, lack of interest, and time conflicts. After data collection was completed with the children, questionnaire packets were mailed to the parents. Despite repeated attempts to collect the parent data over the phone and by mail, slightly less than half of the children's parents completed the questionnaires mailed to them about their children and returned them to us. Thus, the total sample size for the present study consists of 197 parents and their children who had complete data on all parent and child measures. Comparisons of participants with and without complete data revealed that children with complete data were more likely to be white, and to have lower scores on the depression variable than those with incomplete data (ps < .05). That is, parents who were more likely to return their questionnaire packet were more likely to be white and less likely to have a child who scored high on the measure of depressive symptoms used in the current study.

Child participants were in second (n = 63), fourth (n = 75) and sixth grades (n = 59), and their mean ages were 7.44 years (SD = .59) for the second graders, 9.56 years (SD = .67) for the fourth graders, and 11.33 years (SD = .54) for the sixth graders. In total, 60% of the children were female (n = 119), and 73% of the children were African-American (n = 130).

Parents represented a wide range of education and income levels; see Table 2. Overall, 54% of parents report annual family incomes of less than $20,000 ($n$ = 107); 22% of parents did not complete high school (n = 43); 26% of the families had 4 or more children residing in their homes (n = 51); and 57% of parents report being a single parent (n = 113). Most parent participants were mothers (86%), although grandparents (7%), fathers (5%), and other adults (e.g., step-mother, 2%) also participated.

Measures

Community-Level Variables—Community poverty and unemployment were assessed with data gathered from the U.S. Decennial Census; specific variables were used to index the prevalence of unemployment and poverty in each participant's community. The overall U.S. Census data is divided into small geographic regions called census tracts (U.S. Census Bureau 1997). These tracts vary in size from approximately 1,000 to 8,000 people, with an average of roughly 4,000 individuals each. These tracts are further divided into smaller areas called block groups, which are the smallest geographic unit for which Census data is publicly available. In our investigation, each participant's address was cross-referenced with Census databases to obtain their Census tract and block. The prevalence of adult unemployment and persons living in poverty were then obtained for each of these geographic units (U.S. Census Bureau 2000). As this data consists of the raw count of individuals meeting these criteria, we computed proportions by dividing these counts by the total population in each corresponding census block.

For the purposes of this investigation, we used the U.S. Census' official definitions of unemployment and poverty. According to the U.S. Census Bureau, unemployed refers to all civilians 16 years old and over who (1) were neither "at work" nor "with a job but not at work" during the reference week, and (2) were actively looking for work during the last 4 weeks, and (3) were available to accept a job. Poverty is defined as a threshold based on the total income of all family members (before taxes, including earnings like unemployment compensation, and public assistance), divided by one of 48 threshold points (determined by the size and age of the family members), a resultant number of one or less indicates that the family lives in poverty (US Census Bureau 2005). These variables were significantly correlated with each other at r (21) = .81; $p < .01$. Because high correlations can lead to estimation problems due to colinearity, these variables were summed to create a poverty and unemployment composite variable which was used in the subsequent analyses.

Demographic Risk Variable—Individual-level demographic risk information was assessed via a parent questionnaire. A composite risk variable (Demographic Risk), ranging in value from 0 to 6, was created by summing the following six dichotomous demographic variables: (i) child lives in a single parent home, (ii) child lives in a home with four or more children, (iii) parent-reported income is less than $20,000, (iv) parent did not complete high-

school (v) child is female, and (vi) child is an ethnic minority. See Burchinal et al. (2000) for a discussion of the utility of using a composite variable such as this.

Familial Risk Variables—Harsh/negative parenting behavior was assessed with scales from the Self-Expressiveness in the Family Questionnaire (SEFQ; Halberstadt et al. 1995) and the Parenting Behavior Inventory (PBI; Lovejoy et al. 1999). The SEFQ is a 24-item questionnaire that assesses the amount of expressed positive and negative emotions in the family environment. Parents use 5-point scales (1 = never or none of the time; 5 = all of the time or always) to rate how often they express positive and negative emotions. Twelve items assess positive displays of emotion (e.g., "How often do you praise someone for good work") and 12 items assess the expression of negative emotions (e.g., "How often do you blame someone else for family troubles"). Halberstadt et al. (1995) and Dunsmore et al. (2005) reported high internal validity for the two factors in a sample of parents of elementary school children, with alphas ranging from .87 to .89 for the positive factor, and . 81 to .86 for the negative factor. They also have presented evidence of construct stability and validity (see Halberstadt et al. 1995, 1999). In the current study, only the harsh/negative sub-scale was used (SEFQ-Neg); however both of the SEFQ subscales retained their structural integrity when factor analyzed and the Cronbach's alpha of the harsh/negative subscale was .79.

The PBI (Lovejoy et al. 1999) is a 20-item questionnaire that assesses positive and negative parenting behaviors. Each item is rated on a 6-point scale, ranging from 0 (not at all true/I do not do this) to 5 (very true/I often do this). The questionnaire consists of ten items that assess hostile and coercive parenting behaviors (e.g., "I lose my temper when my child doesn't do something I ask him/her to do") and ten items that assess supportive and engaged parenting behaviors (e.g., "I thank or praise my child"). Based on a confirmatory factor analysis of this measure, Lovejoy and colleagues suggested that the PBI contains two factors: supportive/engaged parenting and hostile/coercive parenting (PBI-Neg). In a series of eight studies assessing the psychometric properties of the PBI, Lovejoy and colleagues report the PBI retained high internal consistency (Cronbach's alpha = .83 for supportive/ engaged factor and .81 for the hostile/coercive factor); they also present evidence of test–retest reliability and inter-observer reliability. Our own factor analysis of the PBI on the current data revealed that the subscales retained their structural integrity. One item, "I demand that my child does something (or stop doing something) right away," did not load well onto the hostile/coercive factor. After we deleted this item, the Cronbach's alpha for the hostile/coercive factor was .75.

The negative and harsh parenting behavior scales derived from the SEFQ and PBI were significantly positively correlated at $r = 0.46$, $p < .001$. In previous research the negative subscales of the SEFQ and the PBI loaded onto a latent Negative Parenting factor (Dallaire et al. 2006). Scores on these subscales were standardized and summed to form a composite Negative Parenting Behavior variable used in subsequent analyses.

Negative life events were assessed using a version of a life events checklist, which consisted of 30 negative life events. Representative items include "Your family had to move a lot," "Close family members have yelled at each other," and "A close family member was

arrested or in jail." Minor events (or daily hassles) were not included. Parents indicated whether or not the child has been exposed to each of the events in the past 6 months using a *yes/no* format. We chose this life events measure because it was developed for use with inner city, low SES youth, and contained a high concentration of relevant items given the demographics of our sample. The specific items and the yes/no response format are the same as a life events checklist created by Work et al. (1990). We added a component to the checklist, such that if the respondent endorsed an item, they were asked how upsetting the event was for the child using a 3-point scale (1 = not much to 3 = very much). For each item, a participant's score could range from 0 (the even did not happen) to 3 (the event happened and was very upsetting). Adding the upset score enabled us to capture the degree to which different events impact children's lives. Using this scale in a sample of school-age children, Bruce and colleagues (2006) found that higher scores on this measure were associated with lower levels of self-perceived competence more hopeless and helpless thoughts.

Personal Risk Variables—Children's depressive attributional style was assessed with the Children's Attributional Style Interview (CASI, Conley et al. 2001). The CASI is a semi-structured interview developed to provide a valid and reliable measure of attributional style in young children. The CASI provides data pertaining to both the child's causal reasoning for an event and the child's own ratings of the internality, stability, and globality of their causal reasons. Although the original CASI contained 16 items including both positive and negative events, the current study only used the 8 negative items from the original version. These items represent four interpersonal events (e.g., "You're lining up for lunch and you get pushed") and four achievement events (e.g., "You do a math worksheet, but you get a lot wrong").

After children were presented with each negative event, they were prompted to provide a causal explanation for the event and rate the degree to which the cause of the event was internal, stable, and global on 7-point scales. To assess internality, the experimenter asked the child to think of the reason for the event they had just written down and asked, "How much of your reason is because of you; is it not because of you, a little because of you, or all because of you?" To assess stability, the children were asked "would it [the given reason] just be true this one time, would it be true again and again, or maybe just sometimes?" To assess globality, children were asked "if it [the reason given] would make just this one bad thing happen, lots of other bad things happen, or a few bad things happen?" After each question, children circled a number between one and seven.

Conley et al. (2001) reported that the CASI demonstrated good internal consistency (Cronbach's alphas ranged from .78 to .83) in a sample of middle school children. Conley and colleagues present preliminary tests of the reliability and validity derived from comparisons between the CASI and the Children's Attributional Style Questionnaire-Revised (CASQ-R; Kaslow and Nolen-Hoeksema 1991); these analyses suggest that the CASI subscales had stronger internal consistency than the CASQ-R subscales, especially for attributions for negative events (Conley et al. 2001). In the current study the subscales demonstrated acceptable internal reliability with .64, .75 and .76 for the internality, globality and stability scales respectively. The three scales were significantly, positively correlated (*r*s ranged from .30 to .54). A composite Depressive Attributional Style variable was created by

summing the children's responses on all three subscales, thus higher scores reflect a more depressive attributional style.

Children's self-perceived competence was assessed with one of two perceived competence scales. For younger children (grade 2), we used the Pictorial Scale of Perceived Competence and Social Acceptance for Young Children (PSPC; Harter and Pike 1984). For older children, we used the Self-Perception Profile for Children (SPPC; Harter 1982). Each is described separately below.

The PSPC is a self-report inventory that is appropriate for use with early-elementary aged children. It consists of 24 items measuring perceived competence in four domains (cognitive competence, physical competence, peer acceptance, and maternal acceptance). For each item, the participants are presented with two pictures and are read two sentences describing two different children (e.g., "This child isn't very good at numbers; this child is pretty good at numbers"). They are then asked which statement describes the kind of child who is most like them. Once they have selected their answer, they are asked to refine their choice further by selecting from two more specific choices (e.g., if the child says that they are pretty good at numbers, they are then asked if they are "pretty good" or "really good" at numbers). The items were then scored on a four-point rating scale, such that high scores reflected greater self-perceived competence. In the present investigation, the maternal acceptance score was not used.

The SPPC is a self-report inventory that is appropriate for use during middle childhood. It consists of 36 items measuring perceived competence in five domains (academic competence, social acceptance, athletic competence, physical appearance, and behavioral conduct). In the present investigation, only scores from the academic, social, and athletic competence scales were used (for reasons of comparability with the PSPC, scores from the physical appearance and behavioral conduct sub-scales were not used). Responding to each item is a two-step process. First, participants select which of two statements best describes them. Then, they indicate whether the chosen statement is "really true for me" or "sort of true for me." Items are scored on a 4-point rating scale, such that high scores reflect greater self-perceived competence.

The subscales have good internal consistency; in previous research alphas ranged from .71 to .86 for children in grades 3–8 (Harter 1982); and from .75 to .90 for grades 6 and 7 (Hoffman et al. 2000). In the current study Cronbach's alpha was .83 for the PSPC, and .91 for the SPPC. Other studies have demonstrated that the SPPC has a highly interpretable factor structure (Harter 1982) and have found high 3-month test–retest reliability estimates (*r*s = .70–.87; Harter 1982). The Self-perceived Competency variable consisted of standardized scores on either the PSPC or the SPPC.

Outcome Variable—Children's depressive symptoms were assessed with the adolescent version of the Centers for Epidemiological Studies-Depression Scale (CES-D; Radloff 1977, 1991). The CES-D is a 20-item self-report scale designed to measure depressive symptomatology. Items reflect dysphoric and irritable symptoms, and sleep and eating/ appetite disturbances. Children rate each item with regard to how frequently they experience

each symptom, using a scale of 1 (rarely or none of the time) to 4 (most or all of the time). Representative items include, “I did not feel like eating; I wasn’t very hungry” and “I felt down and unhappy this week.” Radloff (1977) reported that the CES-D was validated using both clinical and nonclinical populations and with adolescents and youth (Radloff 1991). This measure is psychometrically sound, with reasonably high split-half reliabilities (*r*s > . 85), acceptable construct validity (e.g., significant correlation with negative life events and sensitivity to clinical treatment for depression; Radloff 1977), and reasonably high test–retest reliabilities in adolescent samples (above .5, Roberts et al. 1990). Though the youngest children in the current study were younger than children from other samples, extra steps were taken in the administration of this instrument to ensure the children understood the items and response items (see procedures below). Cronbach’s α for the CES-D in the current study was .88.

Procedures

After obtaining approval from the local school administration and the university’s Institutional Review Board, recruitment of participants began. Consent forms were distributed to children at various elementary and middle schools (see “Participants” section). Children were asked to bring the consent form home to their parents and to return the consent form to their teacher. As an incentive to return the consent form students were offered candy (i.e., M & Ms).

Research assistants included doctoral students in clinical psychology and advanced undergraduate psychology majors at a private, mid-sized southern university. Research assistants received extensive training on all of the measures and procedures before data collection. The measures included in this study were a subset of instruments from a larger study administered over two 1-hour sessions, scheduled within 1 month of each other. The CASI and self-perceived competency instruments were administered on different days of data collection, with the CES-D given at the same administration as the self-perceived competency instruments. In order to control for order effects, we counterbalanced questionnaires within each session. To be sensitive to children’s cognitive capabilities, slightly different administration techniques were used for children in different grades. A research assistant worked one-on-one with each 2nd grade child, writing the responses as the child replied verbally or pointed to the answer on a laminated chart. We met with 4th grade children in small groups (3–4 students), and 6th grade children in large groups (20–30 students). After obtaining the children’s assent to participate, a research assistant read the items aloud to the children. In large group administrations, additional research assistants circulated around the classroom to answer questions that arose. To ensure understanding of the questions and response items by all participants, we not only read the items aloud and answered questions as they arose, but we also used a laminated chart as a visual aid to assist the children in differentiating between the different answer choices. At the end of each session children were given candy and decorative pencils for their participation. Parents of the student participants completed a packet of questionnaires that was mailed to their home. In total, these questionnaires took approximately 30–45 min to complete. If parents did not return the questionnaire packet after two mailings, we prompted parents by phone to either

return the questionnaire or complete it by phone. Upon the completion of these questionnaires the parents received a check for $15.

Data Analysis

We utilized Hierarchical Linear Modeling (HLM; Bryk and Raudenbush 1992; see also Guo 2005 for a brief review and illustrative example) as our main data analytic tool. HLM is a powerful technique for examining nested data. In this case, individuals were nested within communities. Using a 2-level HLM approach, we are able to examine the influence of community (poverty and unemployment) as well as demographic, family, and personal variables on children's depressive symptoms.

We adhered to the procedure that Byrk and Raudenbush (1992) recommended for 2-level HLM analyses by first determining the proportion of total variance explained by community differences, or the intraclass correlation (ICC). This step entailed the creation of a fully unconditional model and examines the main effect of the community-level variables, the results of which indicate whether HLM is needed or a single-level method of analysis is more appropriate. With 31% of the total variance in children's depressive symptoms residing within communities, and 53% between communities, and an ICC of .63, these results indicate that proceeding with a multilevel HLM analysis is appropriate and even preferred over traditional fixed effects models.

In the next step, we investigated whether the regression slopes within each community varied systematically across community: that is, does the relation between our Level 1, depressive symptoms, and demographic, family, and personal predictors differ significantly from community to community? We then proceeded with an estimation of a fixed effects model—an estimation of the average effect of the predictor variables on children's depressive symptoms across communities (using the full maximum likelihood estimation setting in HLM 6.0). Finally, we simultaneously examined the effects of Level 1 (demographic, family, and personal), and Level 2 (community) predictors on children's depressive symptoms (see Results below).

Preliminary analyses (see Results below) indicated significant age differences in children's report of depressive symptoms, specifically younger children reported significantly more depressive symptoms, r (197) = −.32, $p < .01$. As such, children's age was entered first, as a control variable, in the following analyses. The order of entry for the variables was chosen so as to highlight potential mediating effects that might exist: After controlling for children's age, the Level 2 community-level variable was entered, followed by Level 1 demographic, family, and then personal variables.

The full within-community individual (Level 1) equation was:

$$\begin{aligned} Y_{ij} = & B_{0j} + B_{1j}(\text{Children's Age}) + B_{2j}(\text{Demographic Risk}) \\ & + B_{3j}(\text{Negative Life Events}) + B_{4j}(\text{Negative Parenting}) \\ & + B_{5j}(\text{Depressive Attributional Style}) \\ & + B_{6j}(\text{Self} - \text{Perceived Competence}) + r_{ij} \end{aligned}$$

where Y is depressive symptoms (the CES-D), B_{0j} is the intercept; B_{1j}–B_{6j} are the coefficients of the child's age followed by the demographic, familial, and personal risk variables and r_{ij} is an error term (the unique input of each child i in neighborhood j). We centered all predictors around their grand means. In doing this, the effects of the Level 2 community predictors on depressive symptoms were estimated at the average within-community level of the individual predictors. Grand mean centering corrects for estimation inaccuracies inherent when using the natural metric when the value zero is not meaningful.

The Level 2, between-community equations were:

$$B_{0j}=G_{00}+G_{01}\,(\text{Poverty and Unemployment Composite})+U_{0j}B_{1j}$$
$$=G_{10};\ B_{2j}=G_{20};\ B_{3j}=G_{30};\ B_{4j}=G_{4j};\ B_{5j}$$
$$=G_{50};\ B_{6j}=G_{60}$$

where B_{0j} is the community average depressive symptoms (adjusted for between community characteristics), G_{00} is the grand mean depression of all communities, G_{01} is the regression coefficient of the community-level predictor on depression, and U_{0j} is the error term (the deviation of the mean depression of community j from the community grand mean, controlling for the community-level predictors). U_{0j} is assumed to be normally distributed with a variance of Tau.[2]

Five sequential models were estimated in the HLM analyses. After controlling for children's age (Model 1), we entered the Level 2 predictor, the community poverty and unemployment composite variable (Model 2), followed by the entry of Level 1 demographic (Model 3), familial (Model 4), and personal (Model 5) predictors.

Results

Preliminary Analyses

Descriptive data are presented in Table 3. Also in Table 3 is information pertaining to the variables used to create the composite demographic risk variable.

As shown in Table 3, the means and standard deviations in the present sample are comparable to, or slightly higher than, the means reported from other low-risk, non-clinical samples on the parenting behaviors and depressive symptoms measures (e.g., Halberstadt et al. 1995; Sourander et al. 2004), suggesting that our sample was comparable to, or slightly more distressed than, other, non-clinical, low-risk, samples. Considering the relatively young age of the children in this sample, the elevated means on the parenting and depressive symptoms scores reflects that our community sample was drawn primarily from a high-risk community. For instance, the means for the 155 high-risk children enrolled in the Fast Track Program are higher at 16.99 (SD = 11.26) and 15.15 (SD = 9.69) yet the children in the Fast Track sample were younger, in grades 1 and 2, respectively (Corrigan 2002a, b). Also, on average, 44% of the children in Fast Track scored at or above the clinical cutoff score of 16

[2]After testing the between community variance for the slope of each predictor variable and finding them to be non-significant, we fixed the variance of each to be zero, or the same across the communities in this sample.

on the CES-D in grades 1 and 2, whereas 34% of children in the current sample scored at or above the clinical cutoff score. However, in comparison to the normative sample enrolled in Fast Track, whose mean CES-D scores averaged over grades 1 and 2 was 11.5, the children in the present study scored higher on the CES-D.

Correlation Results

In Table 4, correlations between the CES-D and each of the Level 1 demographic, familial, and personal risk variables, and children's age are presented. As previously mentioned, age was significantly correlated with the CES-D and controlled in the following analyses. There were no gender main effects for any of the study variables, nor where there any significant gender by age interaction effects.

The CES-D also was significantly positively correlated with the composite demographic risk variable, r (197) = .22, p <.01, negative parenting behaviors, r (197) = .18, p <.01, depressive attributional style, r (197) = .23, p <.01, and negatively correlated with self-perceived competence, r (197) = −.37, p <.01. Depressive attributional style was significantly correlated with negative life events, r (197) = .22, p <.05, but not negative parenting behaviors.

HLM Results

First, as described above, we used a fully unconditional 2-level HLM to obtain preliminary information on how much variance in children's depressive symptoms resides within and between communities. The results of this analysis indicated that with an ICC of .63 it was appropriate to proceed with the HLM data analytic approach; thus we tested and compared a series of hierarchically nested models (see Table 5). The base model (not shown) was fully unconditional. Next in Model 1, children's age was entered as a control variable; this resulted in a statistically significant change in the deviance statistic from the base model. In Model 2, the Level 2 poverty and unemployment composite variable was entered. Also in Table 5 are the regression coefficients that derived from each of these models. The Model 2 coefficient for the community predictor is presented in column 2. The coefficient for the poverty and unemployment composite variable was statistically significant (B = 12.14, p < .01), as was the coefficient for children's age (B = −2.18, p < .01). In Model 3 (column 3), our demographic risk variable was added, this predictor was not significant over-and-above the community-level and age predictors. In Model 4 (column 4), where we added parent-reported familial risk variables, negative parenting was significant (B = 1.35, p < .01), but our index of negative life events was not. In Model 5, where we added child self-reported personal predictors, both depressive attributional style (B = 0.11, p < .01) and self-perceived competence (B = −5.37, p < .01) were significant predictors of children's depressive symptoms. Two other findings are of additional interest. First, our composite of poverty and unemployment was significant in all of the models, indicating that its' influence was not explained by demographic, familial, or personal risk variables. Second, negative parenting behaviors were a significant predictor in Model 4, but not in Model 5, after the personal risk variables were added. This pattern suggests that the effect of negative parenting on children's depressive symptoms may be mediated by personal risk variables, such as self-perceived competence.

Discussion

In the current study, we incorporated an ecological perspective and were guided by previous research on the etiology of depressive symptoms; we examined both community and individual risk factors for depressive symptoms in children by using multiple informants, multiple measures, and an HLM data analytic approach. Three major findings emerged. First, results suggest that community-level variables, specifically the rate of poverty and unemployment in a child's community, and personal variables, specifically self-perceived competence and depressive attributional style, relate significantly to children's symptoms of depression. Second, these findings remained significant, even after accounting for the impact of other individual risk variables, such as demographic and familial risk factors. Third, the results suggest that the effect of negative parenting on children's depressive symptoms may be mediated by children's self-perceived competency. These findings, as well as limitations of the current study and implications, are further discussed below.

General Discussion

Despite the evidence in the risk and resilience literature linking child and family demographic factors, like ethnicity, and parental educational attainment, to problematic child outcomes, like cognitive and behavioral difficulties (e.g., Greenberg et al. 1999), the current findings suggest that after accounting for the impact of community-level poverty and unemployment, demographic risk factors did not significantly relate to children's depressive symptoms. The relation between community poverty and unemployment to children's depressive symptoms was robust, even after accounting for other, more proximal, risk factors. This finding clearly supports the claim that children are put at increased risk for depression by living in conditions associated with poverty (see Evans 2004; Fitzpatrick et al. 2005; McLoyd 2005). This is especially evident when comparing the results of the correlational data to the HLM analyses. In the correlational data we see that the composite demographic risk variable was significantly correlated with children's symptoms of depression; however, once the relation between community-level variables and children's depressive symptoms was taken into account, this relation disappeared. The findings in the current study extend the line of work examining the impact of dangerous neighborhoods on children's social and emotional development (e.g., Fitzpatrick et al. 2005; Sameroff et al. 1998), and show that communities pose unique challenges and confer unique risks to children. These results underscore the importance of examining the complex relations between individuals and the environments in which they exist.

In addition to community-level poverty and unemployment, additional predictors of children's depressive symptoms were personal risk variables including children's depressive attributional style and self-perceived competence. These findings are consistent with Cole and colleagues (Cole 1991; Cole et al. 1997) who have previously demonstrated the importance of self-perceived competence when predicting children's depressive symptoms. The current findings also expand upon Conley's work (Conley et al. 2001) as we found support for attributional style as a correlate of children's depressive symptoms. In addition, the cross-sectional results presented herein partially replicate the findings of Mezulus et al. (2006) and extends our knowledge about the development of children's depression to an

ethnically and economically diverse population. The current findings not only replicate these findings, but also put them in a broader socio-ecological context. Based on these results, we conclude that across communities of varying economic disadvantage and poverty, children's low self-perceived competency and depressive attributional style are associated with higher levels of depressive symptoms in children.

Unexpectedly, negative parenting behaviors and life events did not predict children's depressive symptoms over-and-above the child's personal risk variables. Before the child self-reported personal risk variables were entered into our model, negative parenting behaviors significantly related to children's depressive symptoms. When the child self-reported personal risk variables were entered, however, negative parenting behaviors were no longer significant. These results do not replicate Fitzpatrick and colleagues' (2005) findings. Our methodology differed from theirs, however, in that we utilized multiple reporters, with parents reporting parenting behaviors and children reporting depressive symptoms. Fitzpatrick et al. used only child reports of parenting behaviors and depressive symptoms. The current findings suggest that the effect of negative parenting behaviors on children's depressive symptoms may be mediated by personal variables, including self-perceived competence and attributional style. We quickly note, however, that mediation reflects a set of causal relations that are only roughly approximated in cross-sectional designs. The question of mediation warrants further exploration with longitudinal research methodologies.

Although community poverty and unemployment, children's attributional style, and self-perceived competence predicted depressive symptoms, several hypothesized predictors were not significant. After accounting for community poverty and unemployment, the composite demographic risk variable and negative life events were not significantly related to children's depressive symptoms. First, regarding the composite demographic variable, community characteristics and demographic variables are likely to be very highly correlated, such that community poverty and unemployment may have appeared to explain the apparent effect of any individual demographic predictors. It was unclear how to disentangle certain demographic risk factors (i.e., income, education) from the community in which they exist. With a larger sample, each individual risk factor could be examined, along with the community level predictors. Perhaps the cumulative approach and composite risk factor masked significant relations between specific individual demographic risks and children's symptoms of depression. The relatively small sample size precluded such analyses. Regarding negative life events, it was unexpected that they were not related to depressive symptoms; however, negative life events were significantly positively correlated with children's depressive attributional style. Perhaps the effect of negative life events, as reported by the parents, was mediated by children's own cognitions and depressive attributional style (Abela 2001).

Implications for Intervention and Research

The results suggest two independent avenues for intervention. First, our results support McLoyd's (2005) assertion that increasing a family's standard of living, or in the current study, the community-level of income, might improve children's outcomes. Policy

implications emerge, especially concerning welfare-to-work programs, which are often designed to phase out governmental aid, sometimes causing mothers to take low-wage jobs. Unless employment improves a family's financial status, children's socioemotional development may not be positively affected. Second, our results have implications for educators in terms of intervention and prevention programs. Based on our findings, we suggest that programs focusing on improving young children's self-perceived competence may protect against the emergence of depressive symptoms in children who are at risk. As pointed out by Fitzpatrick and colleagues (2005), self-perceived competence is a psychological resource for children, and in economically impoverished communities, a strong sense of self-efficacy may promote coping efforts and generate a degree of protection from the emergence of depression. Furthermore, perhaps the experience of poverty is an environmental risk factor that may activate one's predisposition towards depression (i.e., Caspi et al. 2003). Further research is needed to examine of the role of stress, poverty, attributional style and self-perceived competence in a group of individuals at high risk for developing depression.

There are implications for researchers in this field. First, the results of this study imply that in future research investigators should examine the degree to which the risk factors explored herein predict not only self-reported depressive symptoms, but clinical depressive disorder. Second, in terms of research design, the results have important implications for researchers considering examining children and families from a bio-ecological theoretical framework. Statistical techniques, such as HLM, are powerful tools for researchers interested in examining nested models and the effects of contextual variables like neighborhood crime, poverty, and violence. Third, these results also suggest that these important contextual variables should be incorporated into theoretical perspectives on the etiology of depression. Fourth, research with children and families from high risk communities is a trying, but critically important, research endeavor. Even within our diverse sample of children and families, participants with complete data from both parent and child were more likely to be white and the children were less likely to be depressed. Perhaps our findings would be more pronounced if we were able to complete our data collection with all of the children's parents. Given the well-documented mental and physical health disparities between socioeconomic and racial groups (see NICHD 2000), researchers should strive to include more children and families from diverse community populations in research designs.

Limitations

Shortcomings in the present study suggest several opportunities for future research. First, given the relatively small sample size for the types of analyses we conducted, we lacked sufficient power to detect small effects. The current study drew heavily from minority and underprivileged communities and helps extend this line of work to minority populations. However, with larger, even more diverse samples, we could better detect even small effects, which may facilitate our understanding of similarities and differences in children's risk for depression across varying economic and ethnic groups.

Second, it was interesting and unexpected that younger children reported greater depressive symptoms, perhaps as children get older they are better attuned to socially desirable

responses and are less likely to report as many severe symptoms of depression. In light of this significant relation, it would have been optimal to examine separate models for each of the three grade levels children were in; however, this would have resulted in three small sample sizes with insufficient power to detect even medium to large effects. Developmental differences should be more carefully attended to in future research of this kind.

Lastly, several other limitations are worth noting. For instance, the current study is cross-sectional. Longitudinal data would allow us to test the mediation model that was suggested by the current study. Though the current study examined relations across levels of an ecological model, a more complete examination would include additional measures, including, for instance, measures of parental depression and children's biological and genetic risk. Finally, though we found significant effects, the overall size of the effects were relatively small, such findings would need to be replicated before any policy recommendations could be made.

Conclusion

We found that community level poverty and unemployment significantly and negatively related to children's depressive symptoms, possibly putting children at risk for developing depression. In addition to community poverty and unemployment, individual-level variables, such as children's depressive attributional style and low levels of self-perceived competence, also were significantly related to children's depressive symptoms. Finally, we found partial evidence that the detrimental effects of negative parenting behaviors may be mediated by personal variables like self-perceived competence. Our results have implications for policy makers as well as educators, and suggest promising avenues for the development of intervention and prevention programs targeting depression.

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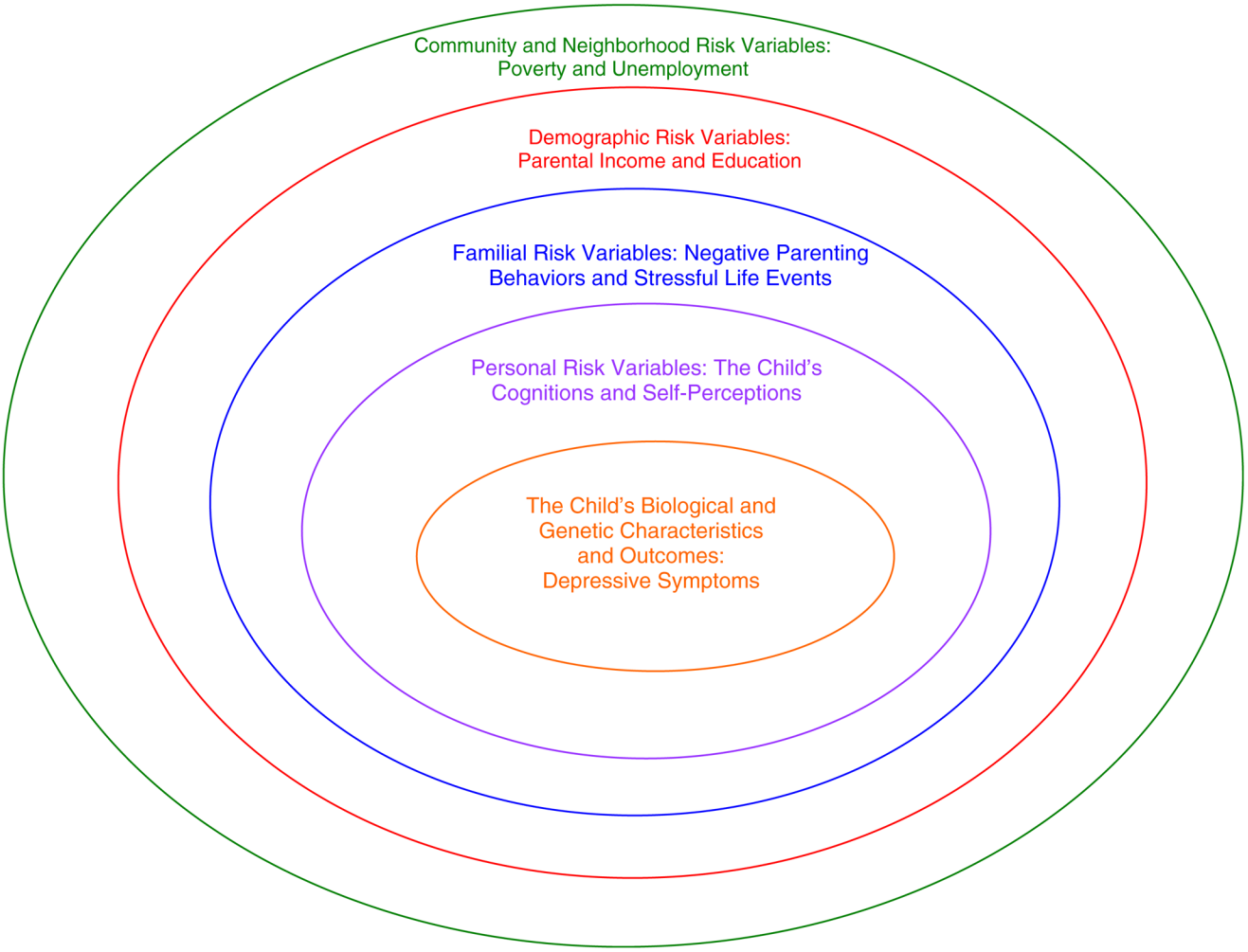

Fig. 1.
Depiction of community, demographic, familial, and personal risk variables

Table 1

Risk variables used in the present study by variable type and informant

Variable type	Informant	Risk variable
Community risk variables	2000 U.S. Census	Unemployment
		Poverty
Demographic risk variables	Parent	Low income
		Large family size
		Low educational attainment
		Single parenthood status
		Child's gender (female)
		Child's ethnicity (ethnic minority)
Familial risk variables	Parent	Negative life events
		Negative parenting behaviors
Personal risk variables	Child	Depressive attributional style
		Low self-perceived competence

Table 2

Parent-reported demographic information: education, income, and family size

Variable	*N*	% of sample
Familial income		
Less than $10,000	70	36
$10,000–$20,000	37	19
$20,000–$30,000	23	12
$30,000–$40,000	20	10
$40,000–$50,000	15	8
$50,000–$60,000	14	7
$60,000–$70,000	6	3
$70,000–$80,000	4	2
$80,000–$90,000	3	1.5
More than $90,000	5	2.5
Highest level of education attained by parent		
8th grade or less	7	3.5
Some high school	37	19
Completed high school	59	30
Some education after high school	73	37
Received Bachelor’s degree	12	6
Some education after Bachelor’s degree	5	2.5
Received Master’s degree	4	2
Number of children living at home		
1	34	20
2	69	35
3	43	22
4	33	17
5	10	5
6	6	3
7 or more	2	1

Table 3

Descriptive statistics for variables used in the current study

Variable level and type	Variable name	*N*	Mean (*SD*)	Range
Level 2 variables		21 neighborhoods		
Community risk factors	Composite of community poverty and unemployment*		0.59 (0.28)	0.22–1.19
	Proportion of unemployed individuals		0.31 (.10)	0.14–0.51
	Proportion of individuals below poverty threshold		0.26 (.21)	0.04–0.68
Level 1 variables		197 parents and children		
Demographic risk factors	Composite demographic risk variable		2.85 (1.63)	0.00–6.00
	Income		3.07[a] (2.37)	1.00–11.00
	Child lives in a single parent home		0.64 (.48)	0.00–1.00
	Educational attainment		3.40[b] (1.19)	1.00–8.00
	Large family size		2.72 (1.38)	1.00–9.00
	Child is female		0.60 (.49)	0.00–1.00
	Child is an ethnic minority		0.65 (.45)	0.00–1.00
Familial risk factors	Negative life events		10.22 (9.79)	0.00–51.00
	Negative parenting behaviors**		−0.04 (1.58)	−3.50–4.70
	Self Expression in the Family (SEFQ-Neg)		26.20 (6.61)	12.00–52.00
	Parenting Behavior Index (PBI-Neg)		16.42 (5.71)	4.00–37.00
Personal risk factors	Depressive attributional style		89.49 (23.97)	30.00–155.00
	Self-perceived competence***		0.00 (.75)	−1.88–1.39
	Younger Children's Self-Perceived Competence (PSPC)		62.71 (6.58)	46.00–72.00
	Older Children's Self-Perceived Competence (SPCC)		53.82 (11.31)	22.00–72.00
Outcome variable		197 Children		
Children's self-reported depressive symptoms			15.07 (7.09)	4.00–45.00

Note:

* This is a composite based on the proportion of unemployed individuals and the proportion of individuals below the poverty threshold

** This is a standardized score based on the harsh/negative parenting scales on the SEFQ-Neg and the PBI-Neg

*** This is a standardized score based on the PSPC and the SPPC

[a]Mean family income was coded on a scale from 1 to 10 with 1 being less than $10,000 and 10 being more than $90,000, mean income was between $20,000 and $30,000

[b]Mean maternal education was coded on a scale from 1 to 7 with 1 being less than an 8th grade education and 7 being received maters degree, mean maternal education was between finishing high school and receiving some education after high school

Table 4

Pearson product moment correlations between children's depressive symptoms and demographic, familial, and personal and risk factors

Variable	1	2	3	4	5	6	7
1. Depressive symptoms	1.00						
2. Demographic risk variable	.22**	1.00					
3. Negative life events	.07	.21**	1.00				
4. Negative parenting behaviors	.18**	.17**	.35**	1.00			
5. Depressive attributional style	.23**	−.05	.14*	.07	1.00		
6. Self-perceived competence	−.37**	−.04	−.10	−.19**	−.10	1.00	
7. Children's age	−.33**	.07	.04	.03	.06	−.02	1.00

* $p < .05$;

** $p < .01$

Note: Demographic risk variable = composite formed from dichotomous risk variables, including parental income under $20,000, single parenthood, less than a 12th grade parental education, 4 or more children living in the home, child is female, and child is an ethnic minority

Table 5

Hierarchical linear models predicting children's depressive symptoms

	Model 1	Model 2	Model 3	Model 4	Model 5
Control variable					
Children's age	−2.7 (0.63)**	−2.18 (0.59)**	−1.75 (0.53)**	−1.85 (0.52)**	−2.16 (0.61)**
Level 2: Community risk factors					
Poverty and unemployment	–	12.14 (2.25)**	10.56 (3.25)**	9.88 (3.25)**	9.42 (2.69)**
Level 1: Demographic, familial, and personal risk factors					
Demographic risk variable	–	–	0.40 (0.43)	0.39 (0.45)	0.42 (0.38)
Negative life events	–	–	–	0.01 (0.07)	0.05 (0.06)
Negative parenting behaviors	–	–	–	1.35 (0.52)**	0.73 (0.45)
Depressive attributional style	–	–	–	–	0.11 (0.03)**
Self-perceived competence	–	–	–	–	−5.37 (0.86)**
Statistics					
Deviance statistic	1959.69	1946.61	1789.14	1661.39	1533.13
df	4	5	6	8	10
Δ Deviance statistic	25.12	12.14	157.47	127.75	128.26
Δ df	1	1	1	2	2

* $p < .05$;

** $p < .01$

N = 197 students from 21 neighborhoods

Note: Unstandardized coefficients (*B*) are shown with robust standard errors in parentheses

All variables are grand mean centered. Demographic risk variable = composite formed from dichotomized demographic risk variables, including parental income under $20,000, single parenthood status, less than a 12th grade parental education, 4 or more children living in the home, child gender (female), and child ethnicity (ethnic minority)