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The Impact of Neglect on Initial Adaptation to School

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Abstract

This study examined the impact of child neglect during the first four years of life on adaptation to school during kindergarten and first grade in the context of neighborhood poverty. Processes related to the development of school competencies were examined, including the mediational role of cognitive functioning and ego-resiliency in shaping children's school outcomes. 170 low-income urban children were followed prospectively for two years (ages four to six). Results indicated that neglected children had significantly lower scores on kindergarten classroom behavior and first grade academic performance than nonneglected children. Children's cognitive performance at age four, controlling for maternal IQ, mediated the relation between severity of neglect and children's behavior in kindergarten as well as their academic performance in first grade. Moreover, severity of neglect was related to children's ego-resiliency at age four. However, additional ecological adversity in the form of neighborhood poverty moderated the link between ego-resiliency and classroom behavior such that at lower levels of poverty, ego-resiliency mediated the relation between severity of neglect and school adaptation. Conversely, when neighborhood poverty was extreme, the effects of ego-resiliency were attenuated and ego-resiliency ceased to predict behavioral performance in kindergarten. The implications of these findings for prevention and intervention are discussed.

Keywords

child neglect; school adaptation; ego-resiliency; cognition; neighborhood poverty; developmental psychopathology

Adaptation to school is a central task of development for children, beginning in early childhood and extending through adolescence. Successful school adaptation requires a variety of competencies in children (Eccles et al., 1996; Pianta, 1999). At the most basic level, children need to demonstrate cognitive and linguistic competence in order to perform well academically in the classroom. They also need to exhibit acceptable levels of motivation and behavioral engagement in school activities. However, successful adaptation to the demands of the school environment also requires a number of non-academic competencies. For example, the ability to regulate and manage one's behavior is critical, as is the ability to adapt flexibly to new situations and to solve problems creatively when they arise. In addition, it is essential that children be able to assimilate into a new social

environment characterized by extra-familial adults and peers. Unfortunately, maltreated children are at risk for poor resolution of this developmental task, resulting in part from prior developmental failures. Child maltreatment has been associated with a wide range of negative sequelae, and poor academic outcomes and problematic school performance are among the documented consequences these children may face (see Cicchetti & Valentino, 2006 for a review).

Although maltreated children in general perform more poorly in school than nonmaltreated children, both in terms of motivational orientation and actual achievement, neglected children in particular appear to be at the highest risk for school maladaptation (Cicchetti & Valentino, 2006). Evidence of the increased risk for school difficulties can be seen even during the preschool years. For example, maltreated infants and toddlers are more likely to exhibit developmental delays by preschool, and children who experienced neglect demonstrate particularly high rates of developmental delay (Scarborough, Lloyd, & Barth, 2009; Scarborough & McCrae, 2010). In addition, neglected preschool-aged children have significantly lower scores on verbal comprehension and expression than other groups of children, including those who have been physically abused (Allen & Oliver, 1982; Culp et al., 1991). There also is evidence of lower Intelligence Quotient (I.Q.) scores among neglected children, even after controlling for the effects of poverty (ACF, 2005; Fishbein, et al., 2009; Gowan, 1993; Perez & Widom, 1994; Polansky et al., 1981).

Once neglected children enter school, signs of academic difficulty quickly emerge. In the longitudinal study of Egeland and his colleagues, neglected children were rated by their kindergarten teachers as having more difficulty comprehending day-to-day school work than children in the adequately-reared group, and they had more difficulty handling the classroom environment (Erickson, Egeland, & Pianta, 1989). Neglected children also demonstrated poor work habits, and they had difficulty working independently. Academic difficulties increased during the early school years for these children, and by second grade all of the neglected children had been referred for special education services (Egeland, 1991). The pattern of poor academic performance among these neglected children continued through adolescence (Egeland, 1997). One limitation of this research, though, was the small sample size of neglected children upon which these findings were based.

Cross-sectional research by Eckenrode and his colleagues revealed school problems in a large sample of neglected children in grades Kindergarten through 12 (Eckenrode et al., 1993; Kendall-Tackett & Eckenrode, 1996). Child neglect (without abuse) was more likely than physical or sexual abuse to be predictive of poor standardized test scores and lower grades in reading and math, even after accounting for the effects of gender and socioeconomic status. Child neglect, alone and in combination with other forms of maltreatment, also was predictive of more grade repetitions, more disciplinary referrals and suspensions, and lower scores in reading, math, and English compared with school performance among nonmaltreated children.

Other research has corroborated these deleterious effects of neglect. In another large cross-sectional study, Leiter and Johnsen (1994) reported that the most pervasive effects on academic performance were associated with child neglect, and that these negative sequelae were over and above the effects of poverty. In a separate investigation, neglected children had more school absences and performed more poorly on academic achievement tests than nonmaltreated children (Wodarski et al., 1990). Longitudinal investigations have yielded similar conclusions. For example, Perez and Widom (1994) followed maltreated children into adulthood and found that children with documented histories of neglect had lower I.Q. and reading scores, after socioeconomic status was controlled. Additionally, neglected and abused children completed fewer years of school, and reported more school difficulties,

including repeating a grade, truancy, and being expelled or suspended, compared with nonmaltreated children (Perez & Widom, 1994). These school difficulties and lower I.Q. effects were particularly pronounced for females (Currie & Widom, 2010).

Although these studies shed light on the deleterious consequences associated with child neglect, questions still remain. For example, how does the severity of children's neglect experiences impact their functioning? Severity of physical neglect has been shown to predict internalizing symptoms during the school-aged years (Manly, Kim, Rogosch, & Cicchetti, 2001). Does the severity of child neglect alter how children navigate the demands of school? Moreover, studies linking child neglect to school performance have revealed little about the processes through which neglect exerts its influence. An ecological transactional approach to understanding the effects of child neglect suggests both that (1) the effects of child neglect on subsequent functioning may be mediated by its effects on prior development, and (2) that adversity in other parts of the ecology may moderate the developmental cascades that link neglect to later school performance (Cicchetti & Valentino, 2006; Masten & Cicchetti, 2010). Understanding the processes by which exposure to early child neglect adversely influences children's adaptation to school is critically important.

Neglect and School Performance: Mediating Processes

Child neglect adversely affects the resolution of important tasks of early development that may ultimately impact successful school entry and subsequent adaptation during kindergarten and first grade. One important developmental domain that is being consolidated during early childhood is cognitive performance. This domain is particularly important because cognitive abilities are strongly predictive of school achievement (Duncan, Dowsett, Claessens et al., 2007). For example, the education literature provides ample evidence that indices of preschool intellectual ability (e.g., verbal skills and I.Q.) predict academic outcomes in early elementary school (see Tramontana et al., 1988, for a review). Research on child neglect demonstrates that neglected children score lower on these indices than comparison children (Allen & Oliver, 1982; Gowan, 1993). Neglecting home environments may be characterized by parent-child interactions that undermine neglected children's intellectual skill development (Cicchetti & Valentino, 2006; Lynch & Cicchetti, 1992; Toth & Cicchetti, 1996). Conversely, home environments characterized by parental involvement, openness, and support have been shown to predict higher scores on receptive vocabulary among African-American kindergarteners (Luster et al., 1995). As a result, children coming from neglecting homes may be less ready for the demands of school because they have not been supported in the mastery of language and cognitive skills. Thus, neglect may have a negative impact on children's school adaptation through the undermining of their cognitive development.

However, cognitive delays are not the sole obstacle to neglected children's readiness for school. In addition to cognitive ability, Haskett, Nears, Ward, & McPherson (2006) identified that ego-resiliency and self-regulation can play a protective role in resilient development of maltreated children. The construct of ego-resiliency involves flexible responsiveness and positive adaptability in adjusting to situational demands with positive affect and self-confidence (Block & Block, 1980; Letzring, Block & Funder, 2005). In low-risk samples, ego-resiliency has been shown to mediate the effects of parenting on academic achievement (Swanson, Valiente, Lemery-Chalfant, & O'Brien, 2011). Shonk and Cicchetti (2001) found that ego-resiliency mediated relations between maltreatment and school functioning. Notably, a majority of the maltreated children in their sample had experienced neglect. When process models of the effects of maltreatment were examined, the effect of maltreatment on maladjustment in the classroom was fully mediated by social competencies and ego-resiliency. Thus, maltreatment resulted in academic maladjustment through its

impact on personal resources, such as children's ability to adapt flexibly to the demands of school. It is likely that neglect played a significant role in this process, but the specific effects of neglect and ego-resiliency were not examined. Neglect is expected to undermine ego resiliency, which would subsequently have a negative impact on children's school adaptation.

Poverty as a Moderator of the Effects of Neglect on School Performance

Neighborhood poverty itself is a risk factor that can undermine healthy development, and the characteristics of impoverished communities – such as high rates of public assistance, low educational attainment, and low socioeconomic status – increase the risk of school failure and drop out (Ainsworth, 2002; Murry, Berkel, Gaylord-Harden, Copeland-Linder, & Nation, 2011; Nikulina, Widom, & Czaja, 2011). High-poverty neighborhoods create an environmental context that undermines successful development through increased stressors such as crime, limited housing, crowding, low social capital, toxins, less access to resources, and a confluence of risk factors across multiple settings, including school (Blair & Raver, 2012; Evans & Kim, 2013). As a result, neglected children who live in impoverished neighborhoods may experience heightened risk for maladaptive outcomes (Bright & Jonson-Reid, 2008), and neighborhood poverty may interact with neglect in predicting academic achievement (Nikulina et al., 2011). An initial study assessing both neglect and poverty suggested that neglect overshadowed the effects of neighborhood poverty in predicting academic achievement, and the impact of poverty on academic success was only significant among nonmaltreated children (Nikulina et al., 2011). However, poverty also has been linked to self regulation and other self-system processes (Evans & Rosenbaum, 2008). Since we are proposing that cognitive performance and ego-resiliency may mediate the effects of child neglect, it is possible, then, that there may be complex interactions involved in the processes that link child neglect and children's functioning in school in the ecological context of high-poverty neighborhoods.

Summary

Given that neglect has received less attention in maltreatment research than other subtypes (Hilyard & Wolfe, 2002), yet neglect may have a detrimental impact on school performance, the central goal of the current study was to examine processes linking child neglect to poor initial adaptation to school. The available evidence provides empirical support for different elements of the mediational models that we propose to examine. First, child neglect has been linked to a number of indicators of poor adaptation to school. In addition, neglected children are likely to have problems with early development, including measurable deficits in their cognitive performance and ego-resiliency.

Based on this evidence, the current investigation examined processes linking child neglect to successful school entry. Initially, we examined differences between neglected and non-neglect children. Subsequently, we examined the impact of severity of neglect in the context of neighborhood poverty. Specifically, we focused on the effects of neglect on children's adaptation to school, along with hypothesized mediators of these effects, including cognitive performance and ego-resiliency. The link between severity of early neglect and later school entry (classroom behaviors and academic performance) may unfold through children's cognitive performance and ego-resilient functioning in early childhood. Moreover, from a developmental psychopathology framework in accord with an understanding that neglect occurs in a larger ecological context, the role of neighborhood poverty in shaping the pathways through which neglect impacts children's adaptation to school was examined. Specifically, neighborhood poverty was examined as a moderator to the underlining mechanism between neglect and school performance. This study extends and expands upon

existing research through a comprehensive assessment with multiple reporters, across domains, and multi- level analyses of the ecology of neglect and its longitudinal effects on school adaptation.

Research Questions & Hypotheses

1. Extant literature suggests that neglected children have more difficulty in school adaptation, but it is not clear whether these school difficulties are evident at the time of school entry. Thus, the initial research question concerns whether neglected children will differ from non-neglected children in early school years. It is expected that neglected children will have significantly more problematic behaviors in kindergarten and lower grades in first grade than non-neglected children.
2. Research on the ontogenic cognitive development of neglected children in the context of exosystem poverty suggests that cognitive delays may be a mechanism through which more severe neglect may undermine academic performance, and that this mediation may be impacted by neighborhood poverty. It is expected that children's cognitive functioning at age four will mediate the relation between early neglect and subsequent classroom behavior in kindergarten and academic performance in first-grade. This mediation link will be moderated by neighborhood poverty such that in high poverty contexts, poverty will exacerbate the effects of neglect on cognitive delays and will weaken the effect of cognitive abilities on school performance.
3. Because school adaptation also is impacted by ego-resiliency, the processes linking severity of neglect to school adaptation via ego-resiliency were examined in the context of neighborhood poverty. It is expected that children's ego-resiliency at age four will mediate the relation between early neglect and subsequent school adaptation. The mediation between neglect and classroom behavior via ego resiliency will be moderated by poverty such that the path from ego-resiliency to kindergarten behavioral performance will be undermined by higher levels of poverty. Poverty will exacerbate the effects of neglect on ego-resiliency and will weaken the effect of ego-resiliency on school performance.

Methods

Participants

Participants in this investigation included 170 high-risk urban children and their caregivers from upstate New York. All children were living with their biological mothers at the time of enrollment. Eighty-two percent of these families were unmarried. Fifty-six percent of the sample had less than a high school education. The sample was ethnically diverse, with African American, Latino, Caucasian, and biracial families represented (88% minority in the total sample; see Table 1). Children were recruited as preschoolers at the age of four years (N=170) and were followed at ages five and six. Over the three phases of the study, retention rates were 92%. Across the time points of the study, 170 families were assessed at age four, 160 families were assessed at age five, and 156 families participated at age six.

Recruitment of maltreated children (N=111) focused on children who had been identified through the Department of Human Services (DHS) as having documented histories of physical neglect. A DHS staff member who was assisting with the project identified eligible children and made the initial contact with families to ascertain interest in participation and to obtain permission to share their contact information with the project team.

To obtain a demographically matched comparison group, nonmaltreating families (N=59) were selected randomly from the County recipients of Temporary Assistance for Needy Families (TANF). Because the majority of neglecting families referred to Child Protective Services are socioeconomically disadvantaged and receiving public assistance (95.5% in the current study; Gaudin, 1999; Sedlak, et al., 2010), utilization of TANF lists provided access to a demographically similar population. In the initial contact, consents were obtained to verify nonmaltreatment status by reviewing DHS central registry data. Medical records also were reviewed to confirm nonmaltreatment status.

Procedure

At the initial assessment, mothers signed informed consent and permission for their children's participation, according to procedures approved by the University Institutional Review Board. Participating families completed initial assessments of children's functioning and the family environment, including demographic information on socioeconomic status, children's race, and ethnicity. Families participated in a laboratory visit at children's age of four years that included a videotaped frustration task and assessment of cognitive performance. Parents signed consent for their children's teachers to be contacted at the end of kindergarten and first grade to complete questionnaires regarding children's behavior in the classroom, and school records were obtained.

Measures

Child Neglect and Abuse Histories—Permission to review DHS records was obtained from all participating families. Histories of maltreatment were coded using the Barnett, Manly, & Cicchetti (1993) Maltreatment Classification System (MCS), which captures detailed information from Child Protective Service (CPS) records by obtaining systematic data from the narrative and investigation determinations contained in DHS records, rather than relying on CPS labels (Manly, 2005). This system captures information on the occurrence of multiple subtypes of maltreatment, including extensive information on severity, and the developmental period during which it occurred. For each report, presence and absence of each subtype is determined based on operational definitions of each category, and severity codes are determined within each subtype.

Neglect is coded when there is evidence that a caregiver has failed to exercise a minimum degree of care in meeting the child's needs or failed to take adequate precautions to ensure the child's safety. Neglect can range from frequently missed meals, unsanitary living conditions, and failure to provide adequate supervision to severe malnutrition, gross inattention to medical needs, or endangering the child in life-threatening situations. Neglect severity was scored on a 1 to 5 scale, with 5 indicative of events that were life-threatening or likely to result in serious physical consequences and 1 indicative of neglect that was relatively mild but still rose to the level of attention by authorities. Adequate reliability for coding of maltreatment subtypes and severity was obtained with intraclass correlations ranging from .81 to 1.0 across subtypes.

Before the age of four, 111 children were from maltreating families and 59 had no documented history of maltreatment. Within the maltreated group, 97 of the 111 children (87%) had reports of physical neglect, including reports of Lack of Supervision, Failure to Provide, and Moral/Legal Maltreatment (Barnett, et al., 1993). Neglect severity ranged from 1 to 5, with 70% of the neglected sample scoring in the moderately high range (3–4 on the 1–5 scale). Multiple subtype occurrence was present for 51% of the sample. Although the sample was originally recruited with a focus on physical neglect, other subtypes were also present before age four; 42 children (38%) had reports of neglect with no other subtypes present and 69 children (62%) had combinations of other subtypes (13 children (12%) had

neglect with physical abuse and emotional maltreatment, 39 children (35%) had neglect with emotional maltreatment, 3 children (3%) had neglect with physical abuse, 2 children (2%) had emotional maltreatment and physical abuse, 7 (6%) children had emotional maltreatment alone, and no children were sexually abused). The latter 9 children had neglect severity equal to 0, and therefore were considered non-neglected in analyses of neglect, along with 5 children who had maltreatment in their families but no reports of maltreatment for the individual children. Subtype and severity were coded separately, and children had a range of severity ratings, regardless of whether they had a single subtype or multiple subtypes. Neglect severity ratings were higher than severity ratings of other maltreatment subtypes for the majority of multiply-maltreated children. Of the children who experienced both physical abuse and physical neglect, 88% (14/16) had severity ratings of physical neglect that were greater than or equal to the severity of physical abuse. 86% (44/52) of the children with physical neglect and emotional maltreatment had higher neglect severity. Thus, neglect was the focal maltreatment subtype in analyses because of the frequency with which neglect occurred and because of these elevated neglect severity ratings relative to other subtypes of maltreatment. Children who were nonmaltreated and those who were maltreated but did not have neglect in their CPS records were classified as non-neglected by assigning a neglect severity score of 0 for analyses of neglect severity. By age six, an additional six children had experienced maltreatment. Because this investigation was designed to examine developmental consequences of early neglect prior to age four, these children were considered nonmaltreated for analyses.

Demographics—The *Demographics Interview* (Cicchetti and Carlson, 1979) was utilized to obtain parent reports of information about race/ethnicity and socioeconomic status, including receipt of public assistance and education.

Maternal I.Q.—The *Wechsler Abbreviated Scale of Intelligence* (WASI; Wechsler, 1999) is a well-validated and standardized brief test of intelligence (Wechsler, 1999). Four subtests (Vocabulary, Similarities, Block Design, and Matrix Reasoning) that correlate .92 with the Wechsler Adult Intelligence Scale-III Full Scale I.Q. were collected with mothers. Mothers' WASI full scale I.Q. was utilized to control for maternal intelligence on children's cognitive performance.

Neighborhood poverty—Poverty in the exosystem was assessed through the use of *Census Tract Data (U.S. Census 2000)*. Government census tracts provide units of analysis for which numerous types of data are readily available. We focused on data pertaining to economic hardship within census tracts or blocks. These data gave us approximations of neighborhood poverty that provide a backdrop for children's more immediate experiences. These factors may moderate the effects of children's adaptation as a result of the added stress they create. Although, census tracts do not necessarily represent the neighborhood as it would be defined by the residents themselves (Coulton et al., 1995), census tract data have been used successfully in a number of studies examining the functioning of high-risk samples (Aber et al., 1998; Korbin et al., 1998). A composite of Neighborhood Poverty was created following the work of Duncan and Aber (1997) using Census variables including rates of high school graduates, home ownership, female-headed households with incomes below the poverty level, and per capita income.

Child Functioning

Cognitive Performance—Several measures of intellectual ability were utilized. The *Wechsler Preschool and Primary Scale of Intelligence-Revised (WPPSI-R)* is a well validated and standardized test of intelligence (Wechsler, 1989). At the age four initial assessment, children completed four subtests that correlate .93 with the full-scale score:

Information, Geometric Design, Block Design, and Similarities. The *Peabody Picture Vocabulary Test (PPVT-III)* and the *Expressive Vocabulary Test (EVT)* were administered as measures of verbal intelligence. The PPVT-III measures children's receptive vocabulary and has been standardized on a representative national sample. It correlates .90 with Full Scale I.Q. on the WISC (Williams & Wang, 1997). The EVT measures expressive language abilities, and likewise has been standardized on a national sample. Correlations between the EVT and Full Scale I.Q. range from .66 to .84 over a range of tests of cognitive maturity (Williams, 1997). In the current study, these three factors were evaluated and estimated in a factor analysis and were shown to form a valid and reliable latent cognitive performance construct.

Ego-Resiliency—The *Barrier Box Task* assessed the child's reaction to a minor frustration (Erickson et al., 1989). Children were in a room with a research assistant who was working at a nearby table. In the center of the room was a large plexiglass box containing a variety of attractive toys, and the box was latched in such a way that a young child cannot open it. A few unattractive toys were left on the floor outside the box. For 10 minutes, the child was allowed to try to open the box, play with the available toys, or wander around the room. At the conclusion of the session, the assistant opened the box and allowed the child to play with the toys for several minutes. The manner in which the child responded to the initial frustration of impeded access to the attractive toys revealed the level of the child's self-confidence and ability to act autonomously. The session was videotaped, and observers unfamiliar with the research hypotheses rated the following variables on three- to seven-point scales: flexibility, positive affect, self esteem, and creativity. These dimensions were selected because in defining ego-resiliency, Block and his colleagues have stated that “as a result of this adaptive flexibility, individuals with a high level of resiliency are more likely to experience positive affect, and have higher levels of self-confidence and better psychological adjustment than individuals with a low level of resiliency” (Letzring, et al., 2005, p. 398). Thus, flexibility, positive affect, self-esteem, and creativity reflect dimensions of ego-resiliency, as well as behavioral engagement. This task has distinguished neglected and adequately-reared children (Erickson et al., 1989).

Each videotape was viewed by two separate teams of trained observers and coded independently. The average correlation between pairs of coding teams for each Barrier Box dimension was as follows: Flexibility, $r = .57$; Positive Affect, $r = .68$; Self Esteem, $r = .67$; and Creativity, $r = .74$. After independent ratings were obtained for each assessment, coding teams met to resolve any discrepancies in their scores and arrived at a consensus score for each Barrier Box dimension across the entire sample.

Classroom Behaviors

Teacher Ratings of Kindergarten Behavior. The *Teacher-Child Rating Scale 2.1* (TCRS, Perkins & Hightower, 2002) was utilized by teachers to rate 32 items on children's social, behavioral, and academic competencies in school. Four positive and four negative items load on the following primary scales: Task Orientation, Behavior Control, and Peer Social Skills. Internal consistency ranges from .87 to .94, and test-retest reliability ranges from .66 to .94 across a number of samples (Perkins & Hightower, 2002). The internal consistency of these three scales in the current sample was very good (Cronbach's $\alpha = .87$ for Task Orientation, .86 for Behavioral Control, and .92 for Peer Social Skills).

Report Card Effort Data. Quantitative indicators of children's performance in school were obtained from school records for all participating children at the conclusion of kindergarten. Language Arts and Math Effort scores from children's report cards indicated behavioral engagement in kindergarten academic tasks.

These scores were on a 1–4 scale, with higher scores indicative of greater effort and engagement.

Academic Performance

School Record Data in First Grade. Final grades in Language Arts and Math from report cards were obtained from school records for all participating children at the conclusion of 1st grade. Because some schools had variations in reporting of grades, all grade data was converted to a 1–4 scale with higher scores indicative of higher grades.

Analytic Plan

The hypothesized models were tested using Structural Equation Modeling (SEM; M-plus Version 6.10; Muthen & Muthen, 1998, 2010). Before modeling, the data were first inspected for missing data and outliers, including normality issues. Across the measures, the average percentage of missing data was 6% ranging from 0 missing data on six measures and peaking at 28.8% on the kindergarten report card data (See Table 3 for sample sizes per variable and time of measurement.) No missing data were present on maltreatment status. Missing data patterns over time (attrition) were analyzed at each wave with regard to the examined variables and were determined to be Missing at Random (MAR; Schafer & Graham 2002). Thus, data missingness was analyzed under missing data theory using all available data via the full information maximum likelihood (FIML) estimation technique (Schafer & Graham, 2002).

To account for non-normality present in the various variables, all of the model-based analyses were conducted using maximum likelihood estimation with robust standard errors (MLR; Yuan & Bentler, 2000.) Subsequently, model fit indices were first determined for the measurement models before pursuing evaluation and interpretation of the structural models. Model fit refers to the ability of a proposed model to reproduce the observed data within a variance-covariance matrix. A good-fitting model is one that is reasonably consistent with the data and therefore does not necessitate re-specification. For SEM models, a variety of global fit indices were used, including traditional model fit indices conforming to the following statistical criteria (McDonald & Ho, 2002) for the Root Mean Square Error of Approximation (RMSEA < 0.08), for the Test of Close Fit ($p > .05$), the Comparative Fit Index (CFI > 0.95), Tucker-Lewis Index (TLI > 0.94), and the standardized root mean square residual (S-RMR < 0.07). With respect to data non-normality, traditional maximum likelihood methods assume the distributions of the continuous variables in the model are multivariate normal, an assumption that is often violated in mediation analyses (Shrout & Bolger, 2002). In order to remedy non-normality issues, the product coefficient method, using a bootstrapping procedure with 5000 sample replicates (MacKinnon, Fairchild, & Fritz, 2007), was used to test mediation paths (Preacher & Hayes, 2008; Shrout & Bolger, 2002). Moderated mediation was tested following model 3 described in Preacher, Rucker, and Hayes (2007).

Results

Table 2 summarizes Pearson and Spearman (for binary measures) bivariate correlations among variables included in the structural models. Table 3 summarizes means, standard deviations, sample size, and minimum and maximum values. At the bivariate level, presence of neglect was significantly associated with lower cognitive functioning, reduced flexibility and creativity dimensions of ego-resiliency, decreased language arts effort in kindergarten, and lower language arts and math grades in first grade. Neglected children also were more

likely to be living in neighborhoods with lower high school graduation rates and lower per capita income.

Presence/Absence of Neglect and School Outcomes

To examine differences between neglected and nonneglected children that would provide comparability with prior research on neglect, we began with a structural model that tested mean differences in kindergarten classroom behavior and first grade academic performance by presence or absence of neglect. The structural model fit indices indicated good model fit (CFI = 0.958; TLI = 0.932; R-MSEA = .078; close fit test $p > .072$; standardized RMR = 0.061). Results showed that neglected children had significantly lower factor scores on both outcomes, kindergarten classroom behavior ($\beta = -.367$; $p < .05$), and first grade academic performance ($\beta = -.239$; $p < .05$).

Test of Measurement for Model 1

In order to obtain a common metric for the examined latent variables, their variance was fixed to 1.00 (Brown, 2006). In the first model (Figure 1), latent factors were constructed for cognitive performance and classroom behavior. The cognitive performance factor was measured by three indicators: PPVT-III, WPPSI-R I.Q., and EVT scores at the child's age of four years. The classroom behavior factor was composed of Kindergarten Report Card Effort (in Language Arts and Math) and TCRS Teacher rating measures from which three subscales were used (i.e., a total of 5 indicators.) The three TCRS teacher classroom rating subscales were a) Task Orientation, b) Behavior Control, and c) Peer Social Skills. The first grade academic performance factor was derived from report card grades in language arts and math. This method of deriving latent factors allowed the model to capture common variance of cognitive performance and classroom behavior from different assessment methods and different measurement subscales and to avoid averaging subscales means that are less reliable (Yang, Nay, & Hole, 2010). The Neighborhood Poverty latent factor was created using the following four indices (See Figures 1 and 2 for factor loadings): rates of high school graduates, home ownership, female-headed households with incomes below the poverty level, and per capita income. The indices were rescaled so high scores on the factors reflected higher level of poverty.

All traditional indices of global fit suggested good fit between the data and the model tested. Specifically, the Root Mean Square Error of Approximation (RMSEA) estimate was equal to 0.062, with the Test of Close Fit ($p = 0.118$). Additionally, the Comparative Fit Index (CFI = 0.949), the Tucker-Lewis Index (TLI = 0.936), and the standardized root mean square residual (S-RMR = 0.067) reflected good model fit. The standardized factor loadings were in the average or larger range ($> .4$) while the measured variables' loadings on the latent variables were all statistically significant (i.e., $p < .001$), signifying that latent variables were adequately measured by their indicators. After inspecting modification indices greater than 4, we allowed error covariance between measures in which we have expected common residual variance due to shared method error (i.e., Kindergarten effort on language and math).

Structural Model 1- Mediation via Cognitive Performance—We then tested the link between severity of child neglect (measured prior to age four years) and child Kindergarten classroom behavior at age five years, followed by first grade academic performance at age six, via cognitive performance measured at age four years. Maternal I.Q. was included as a covariate because maternal cognitive functioning may be expected to be related to children's cognitive functioning. Demographic variables were controlled in all of the SEM models by covarying out minority status (white versus none), history of public assistance (yes versus no), and maternal education (completed high school or not). The structural model fit indices

indicated good model fit (CFI = 0.944; TLI = 0.922; R-MSEA = .063; close fit test $p > .123$; standardized RMR = 0.065). Direct paths were defined from severity of child neglect as an exogenous variable to each of the three endogenous latent variables (see Figure 1). Results of the structural paths are presented in Table 4. There was a significant negative direct path from severity of neglect to the cognitive performance factor, after controlling for variance related to maternal I.Q. and demographic covariates, suggesting that more severe neglect prior to age four was associated with decreased cognitive performance at age four. The links from cognitive performance at age four to Kindergarten classroom behavior at age five and first grade academic performance at age six were statistically significant. In addition, children who demonstrated more positive classroom behavior and more effort in Kindergarten showed better academic performance in first grade. Thus, these findings support an indirect effect from neglect severity prior to age four to later classroom behavior and academic achievement via cognitive performance. In order to test the significance of the mediation path from neglect severity to classroom behavior in Kindergarten and academic performance in first grade, the product coefficient method was used. Following 5,000 bootstrap replicates, analyses confirmed that the mediation paths to Kindergarten and first grade functioning were significant ($\beta = -0.043$; C.I. 95% -0.107 to -0.003 ; $\beta = -0.021$; C.I. 95% -0.056 to -0.002 , respectively). Thus, neglect severity was not significantly related to kindergarten classroom behaviors or first grade academic performance directly, but only indirectly through cognitive performance. Moderation analyses by neighborhood poverty were probed for from neglect to cognitive performance and from cognitive performance to classroom behaviors and academic performance. Specifically, Neighborhood Poverty moderation of the link between child neglect and cognitive performance ($B = -0.021$; $Z = -1.66$; $p = .095$) as well as moderation of the link from cognitive performance to Kindergarten classroom behavior at age five ($B = -0.073$; $Z = -0.132$; $p = 0.835$) and first grade academic performance at age six ($B = -0.008$; $Z = -1.237$; $p = 0.216$) were statistically insignificant.

Test of Measurement for Model 2

In the second model (Figure 2), latent factors were constructed for ego-resiliency and classroom behavior. The ego-resiliency factor was measured by four indicators from the Barrier Box procedure: flexibility, creativity, self-esteem, and positive affect at the child's age of four years. The measurement strategies for the neighborhood poverty, classroom behavior factor, and first grade academic performance factor at model 1 were retained in model 2. Covariates included maternal education, minority status, and public assistance. Accordingly, the model fit indicators for the measurement Model 2 demonstrated very good fit (RMSEA estimate = 0.046; with the Test of Close Fit $p = .603$; CFI = 0.975; TLI = 0.967; S-RMR = 0.067). The standardized factor loadings were large ($> .5$) while the measured variables' loadings on the latent variables were all statistically significant (i.e., $p < .001$), signifying that latent variables were adequately measured by their indicators. After inspecting modification indices greater than 4, error covariance between measures was allowed to be estimated when common residual variance due to shared method error was expected (i.e., Kindergarten effort performance on language arts and math; TCRS Task Orientation with TCRS Peer Social Skills; Barrier Box Self-Esteem and Barrier Box positive affect).

Structural Model 2— Mediation via Ego-Resiliency—The second model tested the link between severity of child neglect (measured prior to age four years) and child Kindergarten classroom behavior at age five years followed by first grade academic performance at age six, via ego-resiliency (ER) measured at age four years. The structural model fit indices were CFI = 0.941; TLI = 0.932; R-MSEA = .050; close fit test $p > .499$; standardized RMR = 0.077. Direct paths were defined from severity of child neglect as an

exogenous variable to each of the three endogenous latent variables (See Figure 2). Results of the structural paths are presented in Table 5. There was a significant negative direct path from severity of neglect to the ER factor, suggesting that higher levels of severity of neglect prior to age four predicted lower factor scores on ER at age four. There were no significant direct paths from ER at age four to classroom behavior at Kindergarten (age five) or academic performance in first grade. This lack of association between ER and later academic outcomes ruled out the possibility that ER served as a linear mediator in the link from severity of neglect to child Kindergarten and first grade functioning. Similar to Model 1, the significant path from Kindergarten to first grade academic performance suggests stability in this longitudinal link.

Based on the current study's developmental psychopathology conceptualization and ecological framework (Lynch & Cicchetti, 1998), we hypothesized that neighborhood poverty may serve as a contextual factor that moderates the link of ER on Kindergarten behavior. Results revealed that the link between ER and Kindergarten classroom behavior was positively moderated by neighborhood poverty (NP). A two-way interaction between ER and Poverty (Higher factor scores indicate less poverty) was statistically significant ($p < .001$). We probed the interaction using a simple slope method (Aiken and West, 1991) described in Selig and Preacher (2009). Specifically, examining factor scores of -1 , 0 and $+1$ SD on the poverty mean score revealed that at lower poverty levels, the effect of ER on Kindergarten behaviors was statistically significant. The simple slope for -1 SD below the mean level in neighborhood poverty was significant ($B = 0.375(0.1221)$, $t = 3.0701$, $p = 0.0025$). In contrast, at average poverty level (i.e., $NP = 0$), and above mean level of poverty (i.e., $NP = 1$ SD), the effect of ER on Kindergarten was insignificant [$B = 0.108(0.089)$, $t = 1.2136$, $p = 0.2267$; $B = 0.159(0.1221)$, $t = -1.3017$, $p = 0.1949$, respectively.] In addition, to further clarify the interaction direction, we conducted multiple group analyses using two groups: high and low Neighborhood Poverty based on median score computed from the sum of all of the Neighborhood Poverty indicators. Analyses revealed that the link between Ego Resiliency and Kindergarten classroom behaviors was significant in the low Neighborhood Poverty ($B = 0.473$; $Z = 3.580$; $p < .001$) group and insignificant in the high Neighborhood Poverty group ($B = 0$; $Z = -0.980$; $p = 0.327$).

Subsequently, we tested for moderated mediation (i.e., conditional indirect effects) using the product coefficient method described in Preacher et al.'s (2007) model 3. Specifically, we wanted to test whether the association between ER and Kindergarten performance is moderated by Neighborhood Poverty within the mediational path models. The conditional indirect test was significant (i.e., $\beta = -0.066$ (0.031); $z = -2.120$; $p < 0.05$), supporting a significant moderated mediation effect. Thus, in neighborhoods with relatively less poverty, ego-resiliency mediated the relation between neglect severity and school adaptation; however, in neighborhoods with extreme poverty, the impact of ego-resiliency was no longer significant.

Discussion

Results from this study provide broad support for the hypotheses generated by our ecological transactional analysis of the effects of child neglect. First, there was evidence indicating that the effects of early experiences of child neglect on subsequent adaptation to school were mediated by prior development. Second, there was evidence that adversity occurring in other parts of the ecology (such as neighborhood poverty) provide an important context that can modify the cascading processes linking child neglect to school performance.

As predicted, children who experienced neglect were more likely to struggle as they entered school. Neglected children had more difficulty in attending to tasks and managing their

behavior in kindergarten, and they were more likely to have lower grades as they moved through first grade. As has been reported for neglected children in later grades (Eckenrode et al., 1993; Kendall-Tackett & Eckenrode, 1996; Leiter & Johnsen, 1994; Perez & Widom, 1994; Pianta et al., 1989; Wodarsky et al., 1990), difficulties in school adaptation were evident at the time of school entry. This study examined the processes through which these school difficulties developed.

Children who experienced more severe neglect in early childhood were exhibiting more cognitive difficulties at age four than non-neglected children. More severe neglect was related to lower skills in receptive and expressive language and I.Q. Severe neglect may lead to lower cognitive performance for several reasons. Severely neglected children may experience poor nutrition, lack of medical care, and unhealthy living environments that may undermine healthy development. Their experience of stress and exposure to additional risk factors – such as poverty – may have a negative impact on brain development and neuroendocrine regulatory systems (Alink, Cicchetti, Kim, & Rogosch, 2012; Cicchetti, Rogosch, Howe, & Toth, 2010; DeBellis, 2005; Shonkoff et al., 2012). In addition, parents who are less educated may provide fewer models of educational attainment and be less likely to provide developmentally appropriate stimulation (Slack, Holl, McDaniel, Yoo, & Bolger, 2004), which includes talking or reading to their children. However, it should be noted that the relation between neglect and cognitive performance in this study was above and beyond the impact of maternal I.Q. Although the physiological and interactional processes linking neglect with cognitive performance were beyond the scope of this investigation, it was clear that children were demonstrating the negative impact of severe early neglect as seen in their poor cognitive performance by age four.

This difficulty with cognitive performance predicted poor adjustment in kindergarten. More severely neglected children who had weaker language and cognitive abilities did not have the necessary resources to negotiate classroom tasks effectively. They were rated by teachers as being less engaged in math and language arts, less behaviorally controlled, and less adept at social interactions with peers. These classroom skills are essential for kindergarten success and predict academic achievement in first grade. As seen in the significant path from Kindergarten to first grade, these behavioral competencies in Kindergarten set the stage for academic performance in first grade. Children who can meet the initial behavioral demands of a formal school environment appear to be better prepared to meet the academic demands of this environment as they move forward. Cognitive performance at age four also was directly related to first grade performance in math and language arts. Although not examined in the current investigation, neglect also may play a role in school success because of attendance problems or failure of neglecting families to enroll children in school or to provide preschool experiences. In our sample, attendance rates in kindergarten were as low as 24% and in first grade were as low as 64% for some children. However, kindergarten absences were not significantly related to first grade academic performance; this issue should be further explored in future research.

Although school performance is likely to be impacted by the larger context of neighborhood poverty, the poverty indices in this study did not significantly moderate the relations between neglect, cognitive performance, and school adaptation in this sample. Within a low-income sample and controlling for family poverty indices, neighborhood poverty was not significantly associated with the mediational processes linking severity of neglect with classroom performance via cognitive performance at age four. Further exploration of these processes with a larger sample and a broader socioeconomic spectrum is warranted to examine the role of the context of poverty on developing intellectual and preacademic skills.

A second model demonstrated the complex pathways by which ego-resiliency influences the relation between neglect severity and school outcomes. In addition to possessing cognitive skills, children's ability to resolve problems with flexibility, creativity, and self-confidence is critical in navigating entry into the school environment. In the current study, severity of early neglect was significantly associated with children's ability to negotiate a problem-solving task successfully. Children without neglect or with less severe neglect approached the experimental task with more ego-resiliency at age four. However, the impact of ego-resiliency on kindergarten behavior interacted with neighborhood poverty such that children with higher levels of ego-resiliency were more successful in their kindergarten classroom behavior and task orientation, but only in the context of less extreme neighborhood poverty. It should be noted that all of the families in the current sample were characterized by low socioeconomic status. The finding that greater ego-resiliency was associated with behavioral competence in kindergarten for children from less impoverished communities is consistent with research showing the importance of self regulation in promoting adaptive functioning among children living in poverty (Buckner et al., 2003, 2009). However, for children living in highly impoverished neighborhoods, the ability of ego-resiliency to promote positive classroom behaviors in kindergarten was weakened.

Along these lines, extremely adverse environments – such as severe neglect in the context of extreme poverty – may overpower developmental competencies that typically contribute to successful early adaptation in school (cf. Eisenberg, Chang, Ma, & Huang, 2009; Evans & Rosenbaum, 2008; Raver, 2012). This conclusion is consistent with Nikulina et al.'s (2011) finding that benefits to academic achievement associated with low neighborhood poverty were only evident in the non-neglected control group. Neglected children in their sample did not benefit by a lack of neighborhood poverty. Presumably the deleterious effects of neglect overwhelmed ameliorative effects associated with low neighborhood poverty. In a similar vein, the combination of severe neglect and extreme poverty appear to represent a greater combined challenge than ego-resiliency is capable of handling. Children facing such extreme ecological adversity may require even greater support as they enter school in order to bring them eventually to a more favorable trajectory of school functioning. As in the first model, adaptive behaviors in kindergarten were predictive of academic achievement in first grade, thus emphasizing the importance of understanding the processes that shape early pathways to school performance.

These findings regarding the mediational role of ego-resiliency are similar to those of Shonk and Cicchetti (2001) in terms of ego-resiliency's association with maltreatment and behavioral maladjustment in school. They found that ego-resiliency mediated the link between maltreatment and behavioral maladjustment; it did not, however, mediate the relation between maltreatment and academic maladjustment. The current study provided a more detailed ecological analysis by examining the severity of neglect in the context of neighborhood poverty. The current findings indicated that at school entry, ego-resiliency predicted behavioral competence in kindergarten for neglected children, but only when neighborhood economic adversity was less severe. These behavioral patterns were predictive of subsequent academic performance in first grade, although the measurement approach was different than that of Shonk and Cicchetti (2001). This investigation advanced the work of Shonk and Cicchetti (2001) by including a two year longitudinal assessment, including assessment of poverty in the exosystem, and specifying dimensions within child maltreatment.

Limitations

This investigation was limited by a relatively small sample size. Although the recruitment and longitudinal follow-up of 111 maltreated and 59 nonmaltreated children was large enough to identify significant processes associated with severity of neglect, the sample size

did not permit examination of gender effects that have been found to play a role in other longitudinal studies (Appleyard, Yang, & Runyan, 2010). Moreover, there were not enough subjects to identify pathways associated with subtypes other than neglect or with subtype combinations or to disentangle other dimensions of maltreatment (Barnett et al., 1993). However, the ability to examine the severity of neglect during early childhood represents an advance in the literature. Most studies of child maltreatment focus on the presence or absence this type of caregiving failure. Relatively few studies to date have looked at maltreatment as reflecting a continuum of problematic and dangerous behaviors ranging in severity. The few studies that have included the severity of maltreatment as an independent variable reveal that maltreatment severity makes unique contributions to children's maladjustment (Manly et al., 2001). The current study adds to this literature demonstrating that not only is child neglect damaging to children's opportunities for school success, but the developmental challenges increase as neglect becomes more severe. Future research should continue to examine processes by which neglect impacts school functioning.

An additional limitation was the somewhat low inter-rater reliability for the ego-resiliency measure. However, all ego-resiliency data were double coded, and discrepancies were resolved by consensus led by an expert coder. Kindergarten report card effort scores were available for 121 of the 170 subjects. This missing data may have limited estimation accuracy and power in the models. However, given that the rate of missing data peaked at 28.8% on a single factor at only one point of time in the longitudinal study, and met missing criteria for MAR, the employment of a state-of-the-art missing data technique (FIML) should have yielded robust and trustworthy model estimations (Schafer & Graham, 2002).

Conclusions

Children who experience neglect are at risk for maladaptation in cognitive development, resilient and flexible problem solving, behavioral adjustment in kindergarten classrooms, and academic performance in first grade. Severity of neglect impacts initial school adaptation, at least in part through its impact on cognitive performance and ego resiliency. The context of neighborhood poverty poses additional challenges that may increase risk of school failure, especially for children who do not receive sufficient familial support. Ego-resiliency and cognitive abilities can play protective roles in buffering the effect of neglect on school adaptation. For children in extremely poor neighborhoods, however, this protective influence is overwhelmed by severe contextual challenges presented by poverty. Preventive approaches should focus on reducing the occurrence of child neglect as well as assisting families with promoting cognitive and coping skills when children have experienced neglect. Ameliorating negative environments for children in extreme poverty also is critical to reduce risks of school failure. Providing high-quality preschool and elementary programs can promote positive developmental trajectories for high-risk children (Blair & Raver, 2012). During times of economic downturn, risks for children increase while funding for preventive programs is often cut. Failing to invest in the development of young children's cognitive and resilient coping skills may result in long-term consequences for their academic trajectory (Heckman, 2006). It is imperative that investments in promoting positive adaptation for high-risk children be a priority to prevent school difficulties.

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Figure 1.

Structural equation model 1: Severity of neglect prior to age four, kindergarten classroom behaviors, and first grade academic performance, mediated by cognitive performance at age four, including neighborhood poverty as a moderator, covarying maternal I.Q., maternal high school education, minority status, receipt of public assistance

Note. $^* = p < .05$; $^{**} = p < .01$; Cognitive Performance Age 4: PPV – PPVT Standard score, WPPSI IQ – Full Scale IQ, EVT – EVT Standard Score; Classroom Behaviors Kindergarten: Task Or – TCRS Task Orientation, Bev C – TCRS Behavior Control, Peer S – TCRS Peer Social Skills, K Lng – Language Arts Effort mean, K Math – Math Effort mean; Academic Performance First grade: Lang – Language Arts grades, Math – Math grades; Neigh. Poverty – Neighborhood Poverty. The structural model fit indices indicated good model fit (CFI = 0.944; TLI = 0.922; R-MSEA = .063; close fit test $p > .123$; standardized RMR = 0.065). The following variables were used as covariates to control for family-level poverty (See Table 4): Maternal high school education, minority status, receipt of public assistance.

Figure 2.

Structural equation model 2: Severity of neglect prior to age four on kindergarten classroom behaviors and first grade academic performance via ego-resiliency, including neighborhood poverty by ego-resiliency interaction as a moderator covarying maternal high school education, minority status, receipt of public assistance

Note. $^* = p < .05$; $^{**} = p < .01$; Ego Resiliency: Barrier Box: Flex – Flexibility, Post af – Positive Affect, Self Est – Self-esteem, Creat – Creativity; Classroom Behaviors Kindergarten: Task Or – TCRS Task Orientation, Bev C – TCRS Behavior Control, Peer S – TCRS Peer Social Skills, K Lng – Language Arts Effort mean, K Math – Math Effort mean; Poverty: Census Tract: CToo – #Owner Occupied Units, CTfh – % Families w/Female Householder no husband w/related kids under 18 below poverty level, CThs – High School Graduate, PerCap – Per Capita Income; Academic Performance First grade: Lang – Language Arts grades, Math – Math grades; The structural model fit indices were CFI = 0.941; TLI = 0.932; R-MSEA = .050; close fit test $p > .499$; standardized RMR = 0.077. The following variables were used as covariates to control for family-level poverty (See Table 5): Maternal high school education, minority status, receipt of public assistance.

Table 1

Demographic Characteristics

<i>Demographics Table</i>			
Descriptors	Maltreated N=111	Non-maltreated N= 59	Test Statistics ^I
Gender of Child (female)	52.3%	52.5%	² .971(1) <i>n.s.</i>
Minority Status (non-white)	89.2%	84.7%	² .402(1) <i>n.s.</i>
Mother's Marital Status (single)	85.6%	78.0%	² .209(1) <i>n.s.</i>
History of Public Assistance	95.5%	91.5%	² .209(1) <i>n.s.</i>
Completed High School	40.5%	51.7%	² .165(1) <i>n.s.</i>

^I Pearson Chi-square

Table 2

Correlations among Model Variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1 Neg Pres																						
2 Neg Sev	.91**																					
3 Gender	.02	-.01																				
4 Minority	-.07	-.03	-.11																			
5 Flex	-.16*	-.15*	-.03	.01																		
6 Creat	-.17*	-.22**	-.16*	.08	.62**																	
7 Self Est	-.10	-.14	.00	.04	.74**	.56**																
8 Post af	-.01	-.07	.01	.20**	.43**	.45**	.58**															
9 CToo	-.09	-.11	-.09	.35**	-.02	.05	.06	.08														
10 CTh	.10	.08	.06	-.35**	-.06	-.08	-.14	-.12	-.66**													
11 PerCap	-.19*	-.18*	-.11	.46**	.04	.09	.08	.13	.66**	-.73**												
12 CThs	-.18*	-.16*	-.11	.38**	.07	.09	.09	.12	.72**	-.74**	.87**											
13 Task Or	-.14	-.09	-.18*	.04	.09	.10	.04	.03	-.01	-.06	.08	.07										
14 KLang	-.22*	-.20*	-.16	-.06	.18	.10	.10	.00	.17	-.16	.10	.20*	.58**									
15 KMath	-.12	-.11	-.08	.12	.14	.06	.09	.04	.21*	-.15	.16	.26**	.51**	.82**								
16 Bev C	-.07	-.09	-.19*	-.01	.02	.06	.03	.03	.08	-.01	.11	.09	.63**	.51**	.44**							
17 Peer S	-.17*	-.17*	-.07	.00	.08	.05	.00	-.02	.01	-.04	.01	-.01	.68**	.45**	.32**	.63**						
18 Lang	-.16	-.09	-.22**	.14	.11	.13	.00	.03	.15	-.09	.17*	.18*	.46**	.39**	.43**	.26**	.30**					
19 Math	-.19*	-.14	-.11	.16	.10	.07	-.02	.06	.09	-.09	.11	.16	.41**	.37**	.38**	.26**	.25**	.81**				
20 WASI	-.09	-.09	-.03	.36**	.17*	.23**	.05	.16	.25**	-.23**	.37**	.38**	.12	.08	.15	.06	.06	.37**	.27**			
21 PPV	-.16*	-.12	.06	.30**	.03	.06	.03	.07	.15	-.18*	.21**	.22**	.29**	.08	.23*	.16*	.16*	.36**	.36**	.34**		
22 Full IQ	-.19*	-.17*	-.07	.32**	.13	.18*	.14	.10	.22**	-.22**	.27**	.30**	.30**	.06	.11	.15	.20*	.42**	.44**	.49**	.65**	
23 EVT	-.21**	-.20*	-.04	.31**	.07	.13	.06	.21**	.17*	-.18*	.27**	.29**	.24**	.03	.14	.07	.09	.49**	.43**	.42**	.69**	.67**

Neg Pres – Neglect Present/absent (age 4; 1=present=absent); Neg Sev – Severity physical neglect (age 4); Barrier Box: Flex – Flexibility, Creat – Creativity, Self Est – Self-esteem, Post af – Positive Affect; Census Tract: CToo – #Owner Occupied Units, CTh – % Families w/Female Householder no husband w/related kids under 18 below poverty level, PerCap – Per Capita Income, CThs – High School Graduate; Kindergarten: Task Or – TCRS Task Orientation, K Lang – Language Arts Effort mean, K Math – Math Effort mean, Bev C – TCRS Behavior Control, Peer S – TCRS Peer Social Skills; First grade: Lang – Language Arts grades, Math – Math grades; WASI Full Scale IQ for bio-mother; Age 4: PPV – PPVT Standard score, Full IQ – WPPSI Full Scale IQ, EVT – EVT Standard Score

Table 3

Means, Standard Deviations, Sample Size, and Ranges of Model Variables

Variables	Mean	SD	N	Min	Max
Gender	.48	.50	170	0	1
Minority	1.12	.33	170	1	2
Neglect					
Neg Pres	.57	.50	170	0	1
Neg Sev	1.91	1.83	170	0	5
Cognitive Performance					
PPV	86.56	14.92	167	42	127
Full I.Q.	82.19	12.71	166	52	117
EVT	89.60	13.42	168	53	127
Classroom Behaviors					
Task Or	26.48	8.69	157	8	40
Bev C	27.28	7.80	157	9	40
Peer S	29.46	8.30	157	8	40
K Lng	3.09	.79	122	1	4
K Math	3.19	.74	121	1	4
Academic Performance					
Lang	2.91	.87	130	1	4
Math	2.89	.91	130	1	4
Mother IQ	84.27	13.34	147	55	118
Ego Resiliency					
Flex	2.73	1.21	168	1	5
Post af	3.21	.94	168	1	5
Self Est	3.88	1.55	168	1	7
Creat	2.24	1.20	168	1	5
Poverty					
CToou	37.81	19.04	170	.8	96.1
CTfh	48.37	16.89	170	7.4	81.7
PerCap	12838.90	5149.98	170	7317	28627
CThs	64.59	12.99	170	42.7	94.9

Neg Pres – Neglect Present/absent (age 4); Neg Sev – Severity physical neglect (age 4); Barrier Box: Flex – Flexibility, Creat – Creativity, Self Est – Self-esteem, Post af –Positive Affect; Census Tract: CToou – #Owner Occupied Units, CTfh – % Families w/Female Householder no husband w/related kids under 18 below poverty level, PerCap – Per Capita Income, CThs – High School Graduate;

Table 4**Cognitive Performance Model**

Direct Effects	B()	S.E.	Est./S.E.
Cognitive Performance			
-> Classroom Behaviors	0.042(0.395)	0.013(0.118)	3.159 ** (3.360 **)
-> First Grade	0.021(0.368)	0.007(0.108)	2.853 ** (3.400 **)
Classroom Behaviors			
-> First Grade	0.244(0.390)	0.052(0.080)	4.688 ** (4.872 **)
Neglect Severity			
-> Cognitive Performance	-1.016(-0.160)	0.488(0.075)	-2.081 * (-2.121 *)
-> Classroom Behaviors	0.005(0.008)	0.049(0.086)	0.094(0.094)
-> First Grade	0.020(0.114)	0.027(0.111)	1.427(0.740)
Mothers' WASI IQ			
-> Cognitive Performance	0.385(0.452)	0.080(0.094)	4.834 ** (4.794 **)
-> Classroom Behaviors	-0.011(-0.133)	0.009(0.110)	-1.167(-1.201)
-> First Grade	0.006(0.114)	0.006(0.111)	1.427(1.031)
High School Education			
-> Classroom Behaviors	0.280(0.128)	0.197(0.087)	1.427(0.917)
-> First Grade	0.131(0.097)	0.098(0.072)	1.329 (0.917)
Minority Status			
-> Classroom Behaviors	-0.289(-0.087)	0.321(0.097)	-0.898(-0.897)
-> First Grade	-0.056(-0.028)	0.165(0.081)	-0.339 (-0.340)
Public Assistance			
-> Classroom Behaviors	-0.043(-0.009)	0.497(0.108)	-0.086(-0.086)
-> First Grade	-0.154(-0.055)	0.175(0.062)	0.882(-0.880)
Indirect Effects	a1*b1	S.E.	95% Confidence Interval
Neglect Severity->Cog->CB (Figure 1)	-0.043	0.026	(-0.107 to -0.003) *
Neglect Severity->Cog->First Grade	-0.021	0.013	(-0.056 to -0.002) *

Note.

* $p < .05$;

** $p < .01$;

Cog= Cognitive Performance at age four; CB= Classroom Behavior in kindergarten. High School Education (1=High School Graduate and 0=Less than 12th Grade Education); Minority (White= 1 and Others=0); Public Assistance (1=with history and non history=0).

Table 5**Ego-Resiliency Model**

Direct Effects	B	S.E.	Est./S.E.
Classroom Behaviors			
-> First Grade	0.306	0.058	5.271 **
Ego-Resiliency			
-> Classroom Behaviors	0.069	0.097	0.713
Neighborhood Poverty X Ego-Resiliency			
-> Classroom Behaviors	0.269	0.083	3.255 **
Neglect Severity			
-> Ego-Resiliency	-0.109	0.046	-2.385 *
-> Classroom Behaviors	0.026	0.080	0.325
-> First Grade	-0.003	0.029	-0.098
High School Education			
-> Classroom Behaviors	0.316	0.182	1.733
-> First Grade	0.209	0.111	1.888
Minority Status			
-> Classroom Behaviors	-0.246	0.351	-0.699
-> First Grade	0.296	0.150	1.973 *
Public Assistance			
-> Classroom Behaviors	-0.020	0.466	-0.044
-> First Grade	-0.199	0.206	-0.969
Indirect Effects	$a1 * (b1 + b3 * 2)$	S.E.	95% Confidence Interval
Moderated mediation (Figure 2)	-0.066	0.031	-2.120 *

Note.

*
p < .05;**
p < .01;

High School Education (1=High School Graduate and 0=Less than 12th Grade Education); Minority (White= 1 and Others=0); Public Assistance (1=with history and non history=0).