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Abstract

Research Findings: Effects of parenting quality on the academic functioning of young homeless children were examined using data from 58 children, age four to seven, and their parents during their stay at an emergency homeless shelter. Parenting quality, child executive function, child intellectual function, and risk status were assessed in shelter, and teacher reports of academic functioning were obtained when children began kindergarten or first grade. As hypothesized, parenting quality was associated with children’s academic success, and this effect was mediated by executive function skills in the child. Parenting quality also had a moderating effect on risk, consistent with a protective role of high quality parenting among children with higher risk levels. Concomitantly, children with higher risk and lower parenting quality appear to be more vulnerable to academic problems. Policy and Practice: In homeless families, parenting may play an especially important role in academic success, through multiple pathways, including the development of executive function skills in their children. Policies and practices to support parents and foster executive function skills of young children in homeless families may be important strategies to promote child academic success. Implications for intervention efforts with homeless parents and children are discussed.
Direct and Indirect Effects of Parenting on Academic Functioning of Young Homeless Children

Parents in high risk families can promote the academic success of their young children in a variety of ways. By providing structure and warm, sensitive care, parents can support the development of crucial cognitive and self-regulation skills that enable young children to make a smooth transition from home or preschool into the formal school environment (Blair, 2002; Harris, Robinson, Chang, & Burns, 2007; Hill, 2001; Morrison, Rimm-Kauffman, & Pianta, 2003; NICHD, 2002; Pianta & Harbers, 1996; Rimm-Kaufman & Pianta, 2000; Supplee, Shaw, Hailstones, & Hartman, 2004; Turner & Johnson, 2003). Parents can also communicate to their children that school is important through positive expectations regarding achievement, encouraging good attendance, talking with children about school experiences, helping them with homework, and maintaining regular communication with their teachers (Arnold & Doctoroff, 2003; Belsky & MacKinnon, 1994; Hill & Craft, 2003; Pianta, Smith, & Reeve, 1991). When children face risks to their academic achievement in the context of poverty and homelessness, the promotive and protective influences of parenting and the parent-child relationship may be especially important (Arnold & Doctoroff, 2003; Hill, 2001; Morrison et al., 2003; Raviv, Kessenich, & Morrison, 2004; Supplee et al., 2004). The purpose of this study was to explore several potential pathways through which parenting quality may promote and protect the academic achievement of homeless children in the early school years. Specifically, we examined whether effects of parenting quality were mediated by child executive function and intellectual function, and whether parenting quality moderated effects of risk on homeless children’s early school functioning.

Large numbers of children in the United States experience homelessness. Data from a national survey in 1996 indicated that approximately eight percent of all families living in poverty had experienced a period of homelessness in the past year, with 900,000 of those
individuals being children (Burt et al., 1999; Huntington, Buckner, & Bassuk, 2008). In 2008, 20 percent of homeless people in the nation were children. Half of those children were less than six years old, and families with young children currently represent the largest growing segment of the homeless population (U.S. Department of Housing and Urban Development, 2009). Although family homelessness has increased over the past several decades in the U.S. (Haber & Toro, 2004), rapid increases in housing foreclosures beginning in 2007 and the current economic recession in the United States, have drawn attention to the needs of homeless families.

Homelessness is considered a marker of high adversity and risk, with children from homeless families falling at the extreme end of an underlying continuum of poverty (Buckner, 2008; Buckner, Bassuk, & Weinreb, 2001; Buckner, Bassuk, Weinreb & Brooks, 1999; Masten, Miliotis, Graham-Bermann, Ramirez, & Neemann, 1993). Children from families who experience homelessness face well-established risks common to other low-income children, such as limited parental education, single parent households, limited financial resources, poor health care, poor nutrition, and exposure to family and community violence (Huntington et al., 2008; McLoyd, 1998; Rog & Buckner, 2007). In addition, homeless children experience risk factors specific to homelessness, such as frequent residential moves with related discontinuities in schooling and relationships, stressful conditions of emergency shelter living, and disruptions in access to services and family support (Buckner, 2008; Masten, 1992; Masten et al., 1997; Torquati, 2002). Although studies comparing homeless children to low-income, more stably housed children have not consistently found differences in adjustment and health, robust differences have emerged for educational outcomes (Haber & Toro, 2004; Obradović et al., 2009; Rescorla, Parker, & Stolley, 1991; Rog & Buckner, 2007; Zima, Wells, & Freeman, 1994). Moreover, it is clear that children in homeless families vary substantially in their achievement
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and adjustment in school, with some children showing resilience while others manifest serious difficulties (Miliotis, Sesma, & Masten, 1999; Obradović et al., 2009). Understanding the nature of the risk and protective processes that may protect child development in the context of homelessness is an important and timely topic, given the growing scope of the problem and the current economic crisis.

*Risks to School Readiness and Academic Achievement*

A variety of studies indicate that homeless children perform worse on tests of academic achievement than more stably housed children from similarly low or higher socioeconomic groups (Buckner, 2008; Masten et al., 1997; Obradović et al., 2009; Rafferty & Shinn, 1991; Rafferty, Shinn, & Weitzman, 2004; Rubin et al., 1996). Furthermore, educational disparities for young homeless children begin early and persist (Obradović et al., 2009). Like other children from disadvantaged families, homeless children enter school with significantly worse scholastic skills, predisposing them to academic difficulties early in the school years and beyond (Arnold & Doctoroff, 2003; Belsky & MacKinnon, 1994; Duncan et al., 2007; Howse, Lange, Farran, & Boyles, 2003; Luster & McAdoo, 1996; Ramey & Ramey, 2004; Supplee et al., 2004). In addition to beginning school at an academic disadvantage, homeless children also are likely to experience disruptions in learning experiences and relationships as they continue changing schools, residences, and possibly cities throughout their school careers, making it all the more difficult for them to achieve at the same levels as non-homeless and non-mobile peers (Obradović et al., 2009; Rafferty et al., 2004).

Rimm-Kaufman and Pianta (2000) have argued persuasively that the first years of school largely set the stage for later academic functioning. Success in the early school years is so vital to later academic achievement that the transition to school can be considered a sensitive period for
promoting school success. These initial school years provide children not only with fundamental skills in reading and mathematics, but also with the basic tools for learning and the means to acquire knowledge. Research has demonstrated the significance of a child’s attentiveness, engagement, motivation, and social skills in the early school years for later academic success in grade school and middle school (Arnold & Doctoroff, 2003; Blair, 2002; Duncan et al., 2007; Hill & Craft, 2003; Ladd, Birch, & Buhs, 1999; Luster & McAdoo, 1996; Turner & Johnson, 2003).

School readiness may have particular importance for young children at very high socioeconomic risk, including children experiencing homelessness, because these children enter these important early school years already disadvantaged (McLoyd, 1998; Ramey & Ramey, 2004; Rog & Buckner, 2007). Educators and policy-makers who plan to address such disparities in achievement need information on the promotive and protective developmental processes that facilitate positive adaptation to school. This is especially the case for young children experiencing homelessness and related educational risks. The transition to school and the early school years represent a window of opportunity for improving success in school.

Promotive and Protective Role of Parents

Effective caregiving represents the most important protective influence for healthy development of high-risk children (Luthar, 2006; Masten, Cutuli, Herbers, & Reed, 2009). Investigations of the detrimental influences of poverty and sociodemographic risk have demonstrated that these distal risk factors impact child outcomes through more proximal influences such as parent function and the parent-child relationship (Arnold & Doctoroff, 2003; Hill, 2001; Morrison et al., 2003; Pianta et al., 1991; Raviv et al., 2004). Given that the majority of young homeless children are embedded within families (Haber & Toro, 2004) and many other
aspects of the children’s lives are in flux, parents in homeless families are likely to play a crucial role in the readiness of their children for the transition to school.

At the same time, parents in homeless families are confronted with many challenges that could undermine their effectiveness as parents (Buckner et al., 2001; Huntington et al., 2008; Torquati, 2002; Vostanis, Grattan, Cumella, & Winchester, 1997). Risks common in the context of homelessness may compromise parenting behavior in caregivers of young children. For example, Torquati (2002) found that family stressors predicted negative parenting in homeless families and noted specific characteristics of living in emergency shelters that may disrupt the parenting process, including the need to manage children in unstructured situations, criticisms of their parenting by others in the shelter, and becoming overwhelmed and demoralized by the living situation.

In this context, it is not surprising that homeless mothers have been found to have lower scores on measures of warmth and provide their children with less cognitive and social stimulation when compared to low income, more stably housed mothers (Haber & Toro, 2004). However, there are relatively few studies examining how differences in parenting within the specific context of homelessness relate to differences in child outcomes. In one study of 59 African American homeless children and their families, Miliotis et al. (1999) found that parenting quality was related to teacher ratings of later academic achievement and adaptive functioning at school. Parent intellectual functioning, education level, and psychological distress did not predict academic outcomes, suggesting that parenting behaviors and the parent-child relationship may have a particularly important protective role in this context.

While the mechanisms by which parenting and the parent-child relationship can promote and protect school functioning in homeless children have yet to be explained, previous research
related to parenting and child school readiness skills in both normative and high risk samples served as a guide for the current hypotheses. Different aspects of parenting and the parent-child relationship have been linked to concurrent and future academic achievement of young children. Parents who speak to their children more often, read books with their children, and specifically teach academic skills such as problem-solving, counting, and naming letters have children who begin school with better verbal and mathematical abilities (Supplee et al., 2004). Parents who have higher, more positive expectations for their children’s success have children who achieve higher grades and ultimately complete more years of school (Belsky & MacKinnon, 1994; Luster & McAdoo, 1996). Furthermore, parents who are more actively involved with their child’s school in terms of communicating with the teacher, attending school functions, and assisting with homework have children who demonstrate better social skills and experience more academic success (Arnold & Doctoroff, 2003; Hill & Craft, 2003; Miedel & Reynolds, 1999). Warmth, discipline, and lack of hostility in the parent-child relationship is related to better child self-esteem, persistence, and motivation in school (Arnold & Doctoroff, 2003; Hill, 2001; Pianta & Harbers, 1996; Turner & Johnson, 2003).

**Hypothesized Mediators of Parenting**

Parental support, involvement, and instruction help children make successful transitions to school by supporting the development of child cognitive abilities including general intelligence, math and verbal skills, and the development of child executive function (Blair, 2002; Englund, Luckner, Whaley, & Egeland, 2004; Morrison et al., 2003; Pianta & Harbers, 1996; Supplee et al., 2004). Many experts define intelligence differently, though it is commonly conceptualized psychometrically as the general factor (g) shared by a variety of different IQ tests (Blair, 2006; Neisser et al., 1996). IQ has been studied extensively across the lifespan and shows...
normative increases with age, though age-corrected standardized scores for individuals remain fairly stable over a person’s life (Neisser et al., 1996). IQ is consistently related to and predictive of math ability, reading ability, academic achievement, and school performance (Neisser et al., 1996). Though much of the variance in IQ scores is attributed to genetic influences, twin studies have demonstrated evidence for environmental influences that may include parenting practices as well (Neisser et al., 1996). In low SES samples, environmental factors predict a great deal of variance in IQ scores (Turkheimer, Haley, Waldron, D’Onofrio, & Gottesman, 2003). Meanwhile, some empirical studies have demonstrated effects of parenting on academic achievement mediated by IQ (Brooks-Gunn & Markman, 2005; Englund et al., 2003; Raviv et al., 2005).

Fostering the development of executive function (EF) skills is another way that effective parents may facilitate successful transitions to school (Blair, 2002). EF generally refers to a set of cognitive abilities used in planning, problem-solving, and other intentional, goal-directed behaviors, including working memory, attention shifting, detecting errors, and inhibitory control processes (Blair & Razza, 2007; Miyake et al., 2000; Zelazo & Cunningham, 2007). EF skills, fundamental for self-regulatory behavior, involve the conscious control or modulation of cognitions, behaviors, and emotions (Zelazo & Cunningham, 2007). These skills are essential for learning and also for successful function in a school classroom. These skills also develop rapidly during the preschool years due to maturation of the brain’s prefrontal cortex and other physiological systems (Blair & Razza, 2007; Zelazo & Cunningham, 2007).

Kindergarten teachers view executive function skills as more important for school readiness than specific academic knowledge, such as knowing letters of the alphabet or how to count to twenty (Blair, 2002). As children enter school, the classroom presents a new context in
which specific demands are placed on the child’s ability to regulate his or her behavior and emotions (Belsky & MacKinnon, 1994). Compared to home and most preschool or daycare programs, kindergarten classrooms have relatively large class sizes and lower adult-to-child ratios (Rimm-Kaufman & Pianta, 2000). In order to learn from academic instruction and perform well in kindergarten, children must be able to remain in their seats, sustain attention over relatively long periods of time, refrain from talking and acting out of turn, and develop harmonious relationships with both teachers and peers. EF skills are important in these regards.

EF skills are distinct from general intelligence, although related. Scores on measures of EF are moderately correlated with performance on IQ tests (Blair & Razza, 2007; Carlson, Moses, & Breton, 2002; Friedman et al., 2006; Mahone et al., 2002). The associations of performance on EF and IQ tests suggest that there may be common factors or processes supporting their development and function. However, specific aspects of EF relate differentially to distinct aspects of intellectual ability. EF measures that involve updating working memory are highly related to measures of intellectual test performance (IQ), whereas behavioral inhibition and set-shifting are less related to IQ (Blair & Razza, 2007; Friedman et al., 2006). Similarly, though EF skills and general intellectual skills are correlated, they independently predict variance in achievement (Blair, 2002; Buckner, Mezzacampa, & Beardslee, 2003; Eisenberg et al., 2004; Englund et al., 2004; Pianta & Harbers, 1996; Valiente, Lemery-Chalfant, Swanson, & Reiser, 2008). For example, when a kindergarten child faces a situation in which he or she must respond to negative peer behaviors at school, the child must control her emotional response and display, which requires an understanding of emotional experiences and some inhibitory control. She must also show strategies for problem-solving, knowledge of a proper course of action, and confidence in his/her ability to either manage the situation or seek assistance from someone else,
such as a teacher. This complex process draws on a variety of skills – intelligence, knowledge, emotion understanding, behavioral control, emotional control, social skills, and problem-solving.

Qualities of parenting and the parent-child relationship show consistent associations with both EF and IQ, as well as with academic achievement (Blair et al., 2008; Calkins & Hill, 2007; Calkins, Graziano, Berdan, Keane, & Degnan, 2008; Diamond & Aspinwall, 2003; Eisenberg et al., 2005; Harrist & Waugh, 2002; Klebanov, Brooks-Gunn, McCarton, & McCormick, 1998; Kochanska, Murray, & Harlan, 2000; Lengua, Honorado, & Bush, 2007; Olson, Bates, Sandy, & Schilling, 2002; Pianta & Harbers, 1996; Raviv et al., 2004; Zelazo & Cunningham, 2007). However, there is limited research on the mediating role of EF in the link between parenting quality and academic achievement in a way that is distinct from general intellectual ability. Given the distinctive links among aspects of EF and IQ, it seems likely that the mechanisms through which parenting may influence the development of EF or IQ skills may be overlapping but not identical. Because of this, it is informative to consider both IQ and EF as possible mediators.

In summary, the positive effects of parenting on academic functioning may be mediated through both EF and IQ. Research on young children in high risk populations indicates that the influence of parents on school success may be particularly important, functioning in distinct ways to moderate risk (Eisenberg et al., 2005; Lengua, 2002; Miliotis et al., 1999; Raver, 2004). It is important to study these pathways among families experiencing high levels of risk.

**Current Study**

Three potential roles of parenting quality were examined in this study. Parenting quality was expected to relate to both general intellectual (IQ) skills and executive function (EF) skills, which in turn were expected to relate to academic achievement, representing a mediated and
indirect role of parenting on academic achievement. Parenting quality was also expected to have unique direct effects on academic achievement not mediated by IQ or EF because parents have additional roles that promote school success, as noted above, including their influence on attendance and social or emotional behaviors not necessarily captured by measures of EF or IQ (Morrison et al., 2003; Pianta & Harbers, 1996; Supplee et al., 2004). Finally, parenting was expected to moderate the effects of varying levels of sociodemographic risk on academic achievement, even when controlling for possible moderating effects of IQ and EF on risk. Though the data were gathered concurrently, mediating and moderating hypotheses were tested in models based on theoretical expectations.

Method

Participants

Participants were part of a larger study of homeless families who had children between the ages of four to seven years old during the summer and fall of 2006, prior to the rapid increase in housing foreclosure of a year later. Families were recruited at a large, urban emergency shelter for homeless families. Families staying at this shelter tend to be single mothers with several young children, and demographic characteristics were comparable to national figures for urban emergency shelters (U.S. Department of Housing and Urban Development, 2009). The average stay for a family at this shelter was approximately 1 month, with families staying anywhere from 1 night to 2 years. Due to limitations of the measures used, five families with limited English proficiency were not recruited. Families who had been at the shelter for less than three days generally were not recruited, in order to allow them time to acclimate. Two families participated earlier at their request.
The following analyses include only the 58 children who were going into kindergarten (n = 20) or first grade (n = 38) during the study. The mean age of these children was 6.1 years (SD = 0.5). The majority of the children were African American (81.0%), with 3.4% Caucasian, 1.7% American Indian, and 13.8% multiracial. Thirty-eight of the children were male (64.4%), and 21 were female (35.6%), reflecting the gender ratio of children this age in the shelter at the time of recruitment. The participation rate of families with children entering kindergarten or first grade was approximately 90%, based on counts taken during one week of each month.

Of the 58 families, 41 were headed by single parents. Though second parents were invited to complete interviews when available, the data presented in this analysis represent only information from the 58 primary caregivers. The primary caregivers included 54 biological parents, two stepparents, and two grandmothers. Four of the primary caregivers were single fathers. The primary caregivers identified their ethnicities as African American (84.5%), Caucasian (10.3%), American Indian (3.4%), and other. These families are demographically similar to those reported in other studies of urban homeless families in the United States, which tend to include a disproportionate percentage of African American and other ethnic minority families, with mostly single mothers staying in emergency shelter with multiple young children (Haber & Toro, 2004; Rog & Buckner, 2007; Toro, 2007). Furthermore, these families reported reasons for becoming homeless similar to those described in other studies, such as eviction, extreme poverty, loss of benefits, and domestic violence (Toro, 2007). Thus the sample is likely a good representation of the population of urban homeless families in 2006.

**Procedures**

Families were recruited for participation by research staff in the cafeteria or lobby of the homeless shelter, or by responding to fliers and letters distributed to their rooms. Families met
with research staff on site at the shelter for one 90 minute session. Once they completed the informed consent process, parents engaged in a face-to-face interview while their children completed a variety of tasks, including an abbreviated IQ assessment and a battery of behavioral tasks designed to assess EF. Portions of the parent interview included questions about demographic information used to assess sociodemographic risk as well as questions about parenting and the parent-child relationship. In appreciation for their time, parents received $20 gift cards and children received small bags of toys at the completion of the session.

Once data collection in the shelter was completed, children were located in area schools and questionnaires were mailed to their classroom teachers. Teachers reported on several school outcomes, including questions related to school engagement and academic competence. Of the 58 children who participated, 54 were located in schools and four were presumed to have left the state. The teachers of all 54 students who received questionnaires returned them and received a $10 gift card as an honorarium.

**Measures**

**Parenting.** Two strategies were used to assess parenting quality: (1) ratings by the parent interviewer and (2) independent ratings by trained judges reviewing the structured parent interview. Immediately following each parent interview, the interviewer completed a set of behavior ratings that included the following five parenting items, each scored on a 5-point scale: how close are this parent and child; how warmly did the parent speak of the child; how positively did the parent speak of the child; what is the quality of the parent-child relationship; and how hostile was the parent in describing the child (reverse scored). These interviewer ratings were based on general impressions of parent behavior in response to the entire 90 minute interview, which involved specific self-report questions about parenting as well as questions about the
child’s behavior. Interviewers were also present to observe how parents interacted with their children during the consent process, although they were blind to the child’s performance on the IQ and EF tasks. These rating scales were adapted from a set of rating scales indexing parent-child closeness that showed high inter-rater agreement, as well as structural and predictive validity in an earlier study of parenting among homeless families (Miliotis et al., 1999). The five interviewer ratings of parenting in the present study also showed strong internal consistency ($\alpha = .89$) and a composite was formed by averaging ratings across the five items. It was not possible to assess interrater reliability as only one researcher was present for the entirety of each interview. To further validate this data, however, parenting was assessed with another method by independent raters who had conducted no interviews, as described next.

At the conclusion of data collection, all of the written responses to structured interviews of parents were rated again by a new team. Each trained rater completed the same set of parent ratings that the interviewer had completed as well as additional ratings summarizing parent self-report of discipline and consistency. The purpose of this set of ratings was to validate the interviewer’s behavior ratings and also minimize potential bias from the likeability and verbal skills of the parent while interpreting and integrating his or her responses. For example, coders were instructed to consider discrepancies in the interview questions, “How close do you feel to your child?” and “How close does your child feel to you?” The following seven items were coded based on written information in the interview: parenting closeness, positive descriptions, quality of relationship between parent and child, parent positive expectations, parental discipline, authoritative parenting style, and overall quality of parenting. Inter-rater agreement was high, with an average intraclass correlation coefficient of .94 across raters and items. Therefore, these
ratings were averaged across raters and then across the seven items to form a second parenting quality composite ($\alpha = .92$).

The two composite parenting variables, one based on interviewer ratings and one based on coded written responses to the parent interview, were moderately correlated ($r = .46, p < .01$), suggesting that the two approaches offered distinct but congruent perspectives. Interviewers were able to integrate impressions from interpersonal interactions and observations while raters were able to closely examine self-reported written information in the context of the interview responses. The two scores were standardized and then combined to form one global composite of parenting quality, with scores ranging from -2.7 to 1.3.

*Risk.* An index of cumulative risk was created to account for differences in risk status within the high risk population of currently homeless families (Masten & Sesma, 1999). The cumulative risk index included a sum of indicators for the following 6 risk factors selected to represent lack of physical resources: family had no income last month; primary caregiver is currently unemployed; primary caregiver has less education than a high school degree; child’s family previously lived in an unsafe neighborhood; child's family could not afford their rent, and child's family previously lived in substandard or unsafe housing. These indicators of sociodemographic risk were chosen to represent risk factors for academic achievement that are not direct measures of parenting, although clearly these kinds of risks could be historically related to the general competence and behavior of a parent.

*Academic Functioning.* Teachers of children in the study completed the Teacher version of the Health and Behavior Questionnaire (Armstrong, Goldstein, & The MacArthur Working Group on Outcome Assessment, 2003; Lemery-Chalfant et al., 2007), which includes a composite measure of Academic Functioning based on two subscales of 8 items related to school
engagement ($\alpha = .87$ in the current sample) and 5 items related to academic competence ($\alpha = .96$ in the current sample). Examples of items measuring school engagement include “approaches new activities with enthusiasm” and “is cheerful in school,” while examples of items measuring academic competence include “how would you rate this child’s current school performance in math-related skills?” and “how would you evaluate this child’s current school performance in reading-related skills?” Teachers are instructed to evaluate children on five-point ordinal scales relative to their same-age peers (Armstrong et al., 2003). The two subscales were significantly correlated ($r = .33, p < .05$).

**Executive function.** Child executive function was measured based on the following four behavioral laboratory tasks: *Simon Says* (Strommen, 1973; Kochanska, Murray, & Coy, 1997), *Peg-tapping* (Diamond & Taylor, 1996), *Computerized Pointing Stroop* (Berger, Jones, Rothbart, & Posner, 2000), and *Dimensional Change Card Sort task* (*DCCS*: Zelazo, 2006). In *Simon Says*, children are asked to perform actions such as clapping their hands and touching their head only when the experimenter gives instructions preceded by the phrase “Simon Says.” The experimenter demonstrates all of the actions, requiring the child to remember the rules, listen carefully to and understand the instructions, and to inhibit the tendency to mimic the experimenter’s actions on trials that do not begin with “Simon Says.” Child performance on *Simon Says* was coded from video by two trained coders who were blind to child performance on the other EF tasks. Interrater reliability was calculated based on 25% of the sample, with a weighted $\kappa = .94$. In *Peg-tapping* the child is asked to tap the table with a wooden dowel once when the experimenter taps twice and twice when the experimenter taps once. Again, the child must remember and follow the rules, inhibiting imitation. Scores for *Peg-Tapping* were based on percentage of correct taps in response to 16 trials. For the *Stroop* task, children point to one of
two pictures of animals presented in consecutive trials on a computer touch screen, first selecting the animal that makes the sound they hear (dog bark, cat meow, cow moo, or rooster crow) for a set of congruent trials, then selecting the opposite animal – the one that does not make the sound they hear – for a set of incongruent trials. Performance was computer scored based on number correct out of the 16 incongruent trials. For the DCCS, the child is asked to sort picture cards first by color and then by shape. Performance was scored by experimenter as the number out of 6 sorted correctly by shape. Both the Stroop and the DCCS require cognitive flexibility and inhibitory control as well as working memory.

Scores for each of the 4 tasks were standardized and combined to create a composite of EF, with high internal consistency (α = .75) and high item-total correlations (r > .70, p < .001). Composite scores ranged from -1.6 to 0.9. For more information on the scoring, reliability, validity, and internal consistency of these tasks in this particular sample, see Obradović (in press).

IQ. Child’s general intellectual functioning (IQ) was measured using the following 3 subscales of the Wechsler Preschool and Primary Scale of Intelligence - Third Edition (WPPSI-III; Wechsler, 2002): Vocabulary, Matrix Reasoning, and Block Design. Raw scores on each of the three subtests were transformed to norm-referenced scaled scores adjusted for age. In standardization samples, each WPPSI-III subtest scaled score has a mean of 10 and standard deviation of 3. Scaled scores from Matrix Reasoning and Block Design were averaged to create a single score, representing performance IQ (r = .38, p < .01), which was then combined with the Vocabulary scaled score, representing Verbal IQ (r = .49, p < .001), to yield an estimate of overall intellectual functioning.

Missing Data
Complete data for all 58 participants were available for the following variables: age, gender, coded parenting ratings, DCCS, child IQ, and cumulative risk. Percentages of missing data for other variables were as follows: interviewer ratings of parenting (3.4%), Simon Says (13.8%), Peg-Tapping (1.7%), Stroop (6.9%), academic functioning (8.6%). The Simon Says task had a higher rate of missingness because a large number of children failed the training trials and the activation trials of the task, indicating that the measure was invalid for these children and failed to assess executive function. Missingness on the Simon Says task was not related to performance on other EF tasks, IQ, or cumulative risk. However, missingness analyses (not presented) suggest that the data meet assumptions of “missing at random” (Fitzmaurice, Laird, & Ware, 2004, ch. 14).

Missing data were imputed using PROC MI in SAS version 8.1 with the recommended expectation-maximization (EM) algorithm and Markov chain Monte Carlo (MCMC) method to create ten imputed datasets (Schafer & Graham, 2002). Data was imputed at the subscale level and then composited as described above. Analyses with the ten separate imputed datasets were combined according to Rubin’s rules (Rubin, 1987), and results using imputed data did not differ from results of the same analyses performed on the original, non-imputed dataset. Results presented reflect the analyses from the multiply imputed data.

Results

Descriptive Statistics and Bivariate Correlations

Presented in Table 1 are descriptive statistics on the main variables included in the analyses as well as the individual items that comprised the composite of parenting quality. On average, parents were rated highest for the closeness of their relationship with their child by both interviewers and structured interview raters. Parents received the lowest scores for warmth
according to interviewers, and for discipline and authoritative parenting according to structured interview raters. Similar to the findings in other studies of homeless children, the sample mean IQ score estimate was approximately one standard deviation below the normative mean. Scores on the cumulative risk index ranged from zero to five out of six risk factors, with a mean score of 2.3 risk factors. Seventy-four percent of the children had scores of three or more. The most common risk factors from the index of six described above were parental unemployment and family could not afford rent at their previous residence.

Correlations among variables included in the analysis are presented in Table 2. The overall composite of parenting quality was significantly correlated with EF scores, child IQ, and teacher report of child academic functioning. As expected, child IQ was significantly but moderately correlated with EF. Age and gender were not significantly related to cumulative risk, parenting quality, or academic functioning. However, age and gender were significantly correlated with both EF and IQ, suggesting that older children and girls received higher scores than younger children and boys, respectively. Both age and gender were included in all analyses as relevant demographic variables. Ethnicity was not related to any variables of interest, perhaps because the vast majority of study participants were African American or multiracial, thus ethnicity was not included in subsequent analyses.

Hierarchical Linear Regression Analysis

A hierarchical linear regression analysis was performed to explore the possibility of mediation and to test the potential moderating role of parenting quality on different levels of cumulative risk for child academic functioning (see Table 3). The first step shows the total effect of parenting quality on academic functioning controlling for child age and gender, and the second step adds the potential mediators of EF and IQ. Cumulative risk was entered in step three
of the model. In step four, the interaction term for parenting quality by cumulative risk score was entered to determine whether parenting quality would moderate effects of cumulative risk on academic achievement, controlling for mediating effects through EF and IQ. Finally, step five of the model included interaction terms based on cumulative risk by EF and cumulative risk by IQ to test whether a moderating effect of parenting could be accounted for by other potential moderators of risk. All variables included in interaction terms were centered prior to being multiplied.

Parenting quality showed a significant main effect for academic functioning in step one ($\beta = .29, p < .05$), controlling for age and gender. In step two, child EF and IQ accounted for an additional 21% of the variance in academic functioning ($\beta = .40, p < .05; \beta = .35, p < .05$; respectively). With child EF and IQ included in the model, parenting quality was no longer a significant predictor of academic functioning ($\beta = .08, p = .67$), consistent with a mediating effect of these two variables. A formal test of this mediation is presented in the following section.

Cumulative risk was not a significant predictor of academic functioning when added in step three of the regression analysis. However, the interaction term entered in step four explained an additional 8% of the variance in academic functioning, indicating a significant moderating effect of parenting quality on cumulative risk. As depicted in Figure 2, the moderating effect of parenting quality shows the classic form of a protective/vulnerability factor. Children with higher quality parenting had higher scores on academic functioning regardless of cumulative risk level. Children with lower quality parenting appeared to do as well as their peers in the sample when risk levels were low. When risk was high, however, children with lower quality parenting had much lower academic scores. Thus children with higher quality parenting appeared to be
protected and children with lower quality parenting appeared to be vulnerable to risk for academic problems. The fourth step of the model, which included child age and gender, parenting quality, EF and IQ, cumulative risk, and the interaction of parenting quality and risk, accounted for 46.3% of the variance in child academic functioning (F(7,50) = 6.16, p < .001).

Finally, interaction terms for EF by risk and for IQ by risk added in step five of the model were not significant predictors of academic functioning. The interaction of parenting quality by risk remained significant ($\beta = .31$, $p < .01$) even when these other potential moderators of risk were included. Due to the relatively small sample size and the large number of terms (nine) in the final model, we also tested alternate moderators in different orders. Both the EF by risk and IQ by risk terms were not significant, even when added independently in the fourth step in the absence of the parenting by risk term. Thus we are confident that, when added in step five, the alternate moderators are not merely suppressed as a result of multicollinearity, but rather do not function as significant moderators of risk on academic functioning.

*Test of Mediated Effects of Parenting on Child Achievement*

The mediated effect of parenting quality on academic functioning through IQ and EF was tested with the bootstrapping method designed for small samples described by Preacher and Hayes (2008). Using their macro for SPSS version 16.0, we tested for the total effect of parenting controlling for age and gender with both child IQ and child EF as simultaneous mediators. With 1,000 bootstrap re-samples, this model showed evidence for mediating effects of parenting through IQ and EF. The total effect of parenting quality on academic functioning when controlling for child age and gender was significant (.29, $p = .04$). The direct effect of parenting quality on academic functioning was .07, $p = .67$. Thus the indirect effect through simultaneous mediators of IQ and EF, calculated as the total effect minus the direct effect, was .22, with a 95%
bootstrap confidence interval of .06 to .35. This confidence interval indicates that the difference between the total and direct effect, accounted for by indirect effects through the mediators, was significantly different from zero. The overall model was significant and explained 33.9% of the variance in child academic functioning. Though they produced a significant effect as simultaneous mediators, only EF had a significant pathway from parenting quality (.35, p < .01). The pathway from parenting quality to IQ emerged only as a trend (.22, p < .10). These results may indicate that EF has a more pronounced mediating pathway by which parenting quality influences academic functioning. The mediator model is depicted in Figure 1.

**Discussion**

Effective parenting appears to be important for the early academic success of children who enter school during or immediately following an episode of homelessness. Parenting quality was related to both intellectual abilities and executive function skills of the child, which in turn predicted early academic success in kindergarten or first grade. Parenting quality also showed a moderating effect on risk with respect to academic success in these children, consistent with a protective or vulnerability role. Children with very high-risk family backgrounds and higher quality parenting had more academic success than children with lower quality parenting from similarly high-risk backgrounds.

*Parenting as a Protective Factor*

Similar to the findings reported by Miliotis et al. (1999), this study yielded support for the protective effects of parenting quality for early school success in homeless children. From birth and throughout childhood, all children depend on parents and other caregivers to teach them skills and to meet their physical and emotional needs (Berger, Kofman, Livneh, & Henik, 2007; Blair, 2002; Feldman, Greenbaum, & Yirmiya, 1999; Harrist & Waugh, 2002; Kopp, 2007; Blair, 2002; Feldman, Greenbaum, & Yirmiya, 1999; Harrist & Waugh, 2002; Kopp,
By responding sensitively to infant cues, supportive caregivers help regulate the child’s physiological needs, level of emotional arousal, and behavioral responses. Supportive caregivers can also talk to their children more and encourage their learning in problem-solving experiences (Pianta & Harbers, 1996; Supplee et al., 2004). As children develop better cognitive and motor abilities, they become more able to act independently and face increasing demands on their capacity to regulate their own thoughts, behaviors, and emotions.

Results of the current study demonstrate the particular importance of high quality parenting for children who face extreme sociodemographic risk and adversities associated with homelessness. For these children, the demands on developing self-regulatory capacities are especially great in the face of residential instability and inconsistent access to essential resources such as adequate food and proper health care. With the support and guidance of high quality parenting, however, children at extremely high risk can demonstrate positive academic functioning and adaptation to the school context. The same aspects of high quality parenting that promote competence in children from lower risk families – specifically warmth, structure, consistent discipline, and positive expectations – serve to protect child development against negative impacts of risk and adversity.

Mediated Effects of Parenting Quality on Academic Functioning

Results of this study also are congruent with previous research and developmental theory suggesting that the effects of parenting quality on school outcomes may be mediated through executive function skills that the child brings to the school context and the tasks of learning. EF skills, indexed here by behavioral tasks, appeared to have unique mediating effects linking parenting to academic success in these young homeless children. Previous research has indicated that IQ mediates the association between parenting quality and academic achievement (Englund
et al., 2004; Raviv et al., 2004); however, this work has rarely included EF in the same analysis. In this study, IQ did not emerge as a significant mediator of parenting quality when included simultaneously with EF. It is possible that limited power affected the results of this study and the mediating role of IQ would emerge with a larger sample size. Results could also reflect better measurement of EF compared to IQ, although the WPPSI-III subtests included here have a high correlation with full scale scores. However, it is also possible that IQ may not function as a distinct mediator of parenting quality in high risk populations when effects of EF are included in the model. This result could occur either because unique aspects of EF mediate the effects or because common processes captured in the shared variance of EF and IQ (which are moderately correlated) play the mediating role. In the very early years of schooling, it is possible that success depends on fundamental abilities to pay attention, control impulses, follow directions, think flexibly, and cooperate with an adult that are indexed well by a set of EF tasks similar to those used here, as well as by many IQ subtests.

Pathways of Parenting Influence on Early Academic Success

Based on the literature as well as the results of this particular study, we suggest several potential pathways through which different aspects of parenting may relate to different aspects of school adjustment in young, disadvantaged children: through IQ, EF, and socio-emotional competence. Parenting practices such as reading and talking with children, teaching strategies for problem-solving, and providing specific instruction likely support the development of intellectual functioning (IQ), which contributes to school performance via math skills and verbal skills. Elements of positive parenting such as emotional support, less direct control of behavior, dyadic regulation of child arousal, modeling or actively teaching self-control, and consistent discipline likely support development of EF, enabling children to ignore distractions, attend to
instructions, and keep themselves organized in the school context. Parental warmth, enthusiasm, and high levels of involvement in school are likely to communicate values about the importance of school achievement, support child self-confidence, contribute to enthusiasm for learning, and foster the development of social skills, enabling children to form relationships with teachers and peers, monitor their emotional responses, and maintain motivation.

**Strengths and Limitations**

Because children in families with high risk and high mobility are particularly challenging to engage in research, this investigation contributes new findings to a limited literature. The study used information from multiple sources including parent self-report, teacher report, behavioral measures of child self-regulation, and interviewer and coder ratings of parenting quality to minimize shared method variance. Furthermore, the children were assessed just prior to school entry in the ecologically valid setting of an emergency homeless shelter with high rates of participation and follow-up.

Still, there are several important limitations to this study. First, parenting quality was measured with a composite variable based on both interviewer ratings of parent behavior in the absence of the child and coded self-report of parents from structured interviews. Though this methodology has proved effective for judging global parenting quality, it may not be sensitive to the specific parenting behaviors or the dyadic qualities of the parent-child relationship that contribute most to child executive function, general intellectual ability, and child academic functioning. Observational measures of parent-child interactions may provide a better methodology for explicating the mechanisms and processes through which parenting and the parent-child relationship supports the development of child intelligence, executive function, and
emotional self-regulation, particularly for the purpose of identifying potential targets of parenting behavior for intervention.

Additionally, parenting quality and child cognitive skills were measured concurrently, and thus the mediating effect can only be assumed on the basis of theoretical expectations. It is also possible that genetic factors shared by parents and children are contributing to the relationship between parenting quality and child functioning. The current study design cannot inform questions about any possible effect of shared genetic variance between parent and child. However, existing research suggests that shared genetic effects may be less salient in high risk samples where environmental effects tend to be more predictive, especially in samples of children from very low socioeconomic backgrounds (Turkheimer et al., 2003).

Clearly more research is needed to understand the developmental processes that promote school achievement in young homeless children, and especially the promotive and protective processes that may be amenable to intervention. Future investigations should include larger and more representative samples that can support more complex analytical strategies with appropriate power to detect effects. For example, a larger sample size with similar data could use structural equation modeling to combine the mediation and moderation of parenting into a single analysis. Research on parenting in homeless families should also include observational measures that can demonstrate more specific aspects of parent behavior and the parent-child relationship that predict child outcomes and may serve to moderate the negative effects of risk on school success. Longitudinal studies with repeated assessments could elucidate the direction and nature of processes linking parent and child behavior.

Conclusion
High quality parenting functions as a powerful protective factor for young homeless children’s adjustment to school. Parents in homeless families can foster resilient functioning with warmth, consistent discipline, structure, and positive expectations in much the same way that parents in other families foster competence. An important part of the influence of parenting quality on academic functioning appears to function through its impact on child executive function skills. Understanding parenting behavior of effective parents in homeless shelters may be highly informative for developing and improving programs to support and facilitate parenting in similar difficult situations.

Results from this study can help inform efforts aimed at improving the early academic success of young homeless children. Homelessness and residential instability are pervasive and important issues that demand attention during periods of economic growth as well as recession. Interventions with homeless families might focus on encouraging warmth, structure, consistent discipline, and positive expectations in the parent-child relationship as a means to promote child executive function and learning. Bolstering parenting practices related to these aspects of the parent-child relationship are likely to also assist in protecting the development of children experiencing risk and adversity, above and beyond the indirect benefits achieved through improved EF. For example, early education programs could prioritize the inclusion of parent components that encourage positive parent-child interaction as well as parent involvement in learning and school-related activities. Additionally, these programs could include parent-only components focused on educating parents about warmth and effective discipline in times of stress. Improvements in parenting quality during this sensitive period for school success are likely to show positive effects for both child executive function and adjustment to kindergarten for homeless and other highly mobile, high-risk children.
References


Table 1: Descriptive Statistics

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Table 2: *Bivariate Correlations (n = 58)*

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*p < .05, two-tailed **p < .01, two-tailed
Table 3: Hierarchical Linear Regression demonstrating moderating effect of Parenting Quality on Cumulative Risk for teacher reported Academic Functioning, controlling for Age, Gender, Executive Function, and Child IQ.

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## Parenting and Homeless Children 43

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### Step 5

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Note. $R^2 = .09$ for Step 1; $\Delta R^2 = .21$ for Step 2 ($p < .01$); $\Delta R^2 = .02$ for Step 3 (n.s.), $\Delta R^2 = .08$ for Step 4 ($p < .01$); $\Delta R^2 = .02$ for Step 5 (n.s.).

$p < .10$, two-tailed * $p < .05$, two-tailed ** $p < .01$, two-tailed
Figure 1. *Model of indirect effects of parenting quality on academic functioning through IQ and executive function. Control variables of age and gender were included but are not shown here.*

\[ p < .1, \text{two-tailed} \]
\[ *p < .05, \text{two-tailed} \]
\[ **p < .01, \text{two-tailed} \]
Figure 2. *Parenting Quality moderates effect of cumulative risk on child academic functioning.*