One of the most pernicious aspects of poverty is that it is self-reinforcing. For example, it at once magnifies the power of educational success as a means of social mobility and interferes with the probability of such success occurring. Because poor children have lower rates of achievement in the core curricula of the educational system, they are less able to obtain the high-status academic credentials that have become necessary for securing well-paying, stable jobs in the modern American economy and, therefore, are more likely to face economic hardships as adults (Duncan et al., 1998; Mayer, 1997). This phenomenon suggests that social policies aimed at alleviating poverty will benefit from a consideration of the role of education in this intergenerational cycle, specifically by identifying actionable methods of promoting schooling success among poor children as a way of boosting their long-term prospects.

The social and behavioral sciences can inform such policy by building a base of knowledge on risk and protective mechanisms in the education of poor children. This study does so by drawing on a core theoretical perspective of human development—the family process model (see Elder, 1999; McLoyd, 1998)—to better understand how to assist poor children as they transition into and through the early elementary school years. Specifically, the Early Childhood Longitudinal Study – Kindergarten Cohort (ECLS-K) is used to investigate: 1) poor children's rates of math and reading learning in first grade and growth in learning across subsequent years, 2) family processes that mediate this link between poverty and early learning, and 3) school factors that protect against the negative impact on learning of family processes associated with poverty.

The family process model is a fusion of sociological and psychological perspectives that posits that the effects of poverty on child development are filtered through family dynamics (McLoyd, 1990). From the broad, and growing, family process literature, three general aspects of the home environment—the mental health of parents, parents' marital/romantic relationships, and parenting practices—have emerged as primary avenues through which family process link poverty to child development (Mistry, Vandewater, & Huston, 2002; Gutman & Eccles, 1999; Conger et al., 1994; McLoyd & Wilson, 1994). For the most part, the family process model has been leveraged to explain socioemotional rather than academic development. Yet, the basic tenets of this model are directly applicable to the educational domain of child development. After all, the seminal work of Alexander and Entwisle (1999, 1988) has demonstrated that family dynamics are a driving force of inequalities in early education. At the same time, the family process model has not been applied to developmental patterns, neither socioemotional nor academic, during the transition to elementary school, which is problematic because this period encompasses the first major life course transition and the introduction of the child to the public domain. Moreover, because of the cumulative nature of the educational system and the self-fulfilling nature of educational experiences, this transition lays the foundation for the entire educational career (Entwisle & Alexander, 2002; Pianta & Cox, 1999). Thus, the family process model at the heart of this study focuses on education, specifically learning patterns in the first few years of elementary school. Poverty is hypothesized to affect parent mental health, parent relationships, and parenting practices in ways that shape early learning. Because of this focus on early education, the parenting practices to be considered in this application of the family process model are those related to school readiness, such as

parental management of children's learning, involvement in education, and construction of home learning environments.

After establishing the value of its particular family process model, this study focuses most of its attention on the identification of school factors that buffer against the family-related educational risks of poverty. To incorporate potential school-based protective factors into the family process model, we consider three aspects of the school environment. First, because of the likelihood that problematic processes in poor families are a function of concomitant home and community upheaval, stability at school (e.g., experienced and long-tenured teachers) might provide an additional dose of security to the school lives of poor children that allows them to engage more fully in the learning process (Lee & Burkham, 2003; Mayer, 1997). Second, because poverty-related family processes tend to reduce the flow of school-specific information and instrumental support to poor children, school environments that actively engage children in their education and that tap them into valuable information channels (e.g., parental outreach) will likely make more of a difference for poor children's learning than their peers (Coleman, 1990). Third, poor families are less able to provide many of the material and practical resources that promote school readiness, such as health care, learning tools, and information technology. Consequently, classes and schools that have more services and materials (e.g., health services, classroom computers) will fill a void in poor children's lives that allows them to make up ground (Coleman, 1990; Millstein, 1988).

Method

Data

ECLS-K is a nationally representative sample of American kindergarteners created by the National Center of Education Statistics with a multi-stage sampling frame. These students were enrolled in part- or full-day kindergarten at the first wave of data collection in the fall of 1998. Five subsequent waves of data collection occurred during the following six years. In each wave, ECLS-K interviewed parents, teachers, and school administrators and assessed children with diagnostic tests. The analytical sample of this study included all children who participated in the two kindergarten waves as well as the first and third grade waves, who had valid sampling weights assigned to them, and who participated in cognitive assessments in each of these waves (n = 12,519).

Measures

Cognitive achievement. At each data collection, children took timed tests in math and reading. The math test included items on conceptual and procedural knowledge, problem-solving, number sense, and measurement. The reading test assessed the ability to define words in context, identify figures of speech, and evaluate passages of text. Children took the first stage of the test and then, based on their performance, the low-, medium-, or high-difficulty stage. Item Response Theory scores allowed the development of single proficiency scores across test sequences.

Family poverty status. In the kindergarten data collection, parents reported their annual family income and the number of people in their family. Combining these pieces of information allowed for the calculation of an income to needs ratio that could then be compared to the federal poverty line (FPL, see U.S. Census Bureau, 2002) to create three markers of family poverty: at or below 50%, 51-100%, and 101-150% of the FPL. These

family poverty variables were analyzed with controls for parents' educational status, occupational status, employment status, and marital/cohabitation status.

Family processes. Family processes were measured with parent reports in kindergarten, including measures of parent mental health (parent-reported depression), parents' marital relationship (whether the child had experienced a parental divorce), and parenting practices including measures of home learning environment, reading activities, and parental involvement in education first used by Magnusson and colleagues (2004).

School factors. School factors were created with first grade information from school administrators and teachers and by aggregating child and family characteristics to the school-level. These school factors encompass three categories: stability (mobility of student population, teacher training, teacher tenure, neighborhood setting), climate (parent outreach, subject-specific teaching strategies), and services/resources (learning materials, computer technology, health services, family services).

Control variables. Numerous control variables were created to account for demographic variability and to protect against spuriousness and selection. These included race/ethnicity, immigration status, gender, age, year in kindergarten, pre-K child care arrangement, language status of cognitive assessment, timing of assessment, school sector, school size, school Title I funding, school socioeconomic status, school region, and school urbanicity.

Plan of Analysis

The analytical plan of this project encompassed three general steps: 1) the estimation of the basic family process model of first grade achievement, 2) the incorporation of school factors and family x school interactions into this model of first grade achievement, and 3) and the extension of these first grade models to cover achievement growth between first and third grades. In each of these steps, both math and reading achievement were considered. These models were estimated in the mixed procedure, which is the SAS procedure for multi-level modeling.

Results

Up to this point, we have performed preliminary analyses that shed light on most of the general aims of this study. All of the specific aims, however, will be analyzed completely by our PAA session. Below, we give a summary of the results that we have seen so far.

After controlling for sociodemographic characteristics and school structural characteristics, family poverty (100% of the poverty line) was a strong and significant predictor of both math and reading achievement in first grade. Both of these associations were significantly attenuated by the inclusion of the other family socioeconomic characteristics, especially parent education, although they remained statistically significant. Finally, family poverty also predicted math and reading achievement in third grade, net of first grade achievement (as well as the control variables). Again, these associations were attenuated but not eliminated by the inclusion of the other family socioeconomic characteristics.

To examine the degree to which these poverty risks were channeled through family dynamics, we added the full set of family process variables. Of these, parent depression, parental divorce, reading activities, and parental involvement in education predicted math and reading achievement in first grade, net of the sociodemographic

characteristics, school structural characteristics, family socioeconomic characteristics, and family poverty. Parent depression and parental involvement also predicted math and reading achievement in third grade even when first grade achievement was controlled. Furthermore, the inclusion of these family process variables attenuated the family poverty coefficients in all models by as much as 50%. Parental involvement in education was, by far, the most important family process variable in terms of its prediction of achievement and its attenuation of the achievement risks of family poverty.

Next, we re-estimated the baseline models for math/reading achievement in first and third grade, this time replacing the family process variables with a limited set of school context variables. Overall, the school factors were less predictive of achievement than the family process variables, and they did not attenuate the poverty-achievement associations in any model by more than 10%. Of the school factors, teaching strategies and student body composition provided the most additive value to the achievement models and did the most to account for the achievement risks of family poverty.

Preliminary Conclusions

Children from poor families began elementary school with lower levels of achievement in core curricula than their peers from more affluent backgrounds and, from this lower starting point, posted fewer gains in learning over the following three years. Thus, they entered school at a disadvantage that widened over time, a vivid example of cumulative disadvantage. For the most part, the cumulative risks to early learning posed by family poverty were a function of concomitant family characteristics, especially the tendency for poor parents to be less educated than other parents. What was not accounted for by the socioeconomic and demographic correlates of family poverty was explained by parent health, family instability, and the tendency for poor parents to be less involved (through their own actions or the actions of school personnel) in their children's schools. To a lesser extent, where poor children went to school and the classrooms they entered within schools also played a role.

The next step in this study, which will be completed by the PAA meeting, is to examine the degree to which the school factors help to moderate, or condition, the family processes that link family poverty to achievement and achievement growth. Thus, we will add interaction terms between parent depression, parental divorce, and parent involvement on one hand and all of the school factors on the other. The aim is to identify the types of schools and classrooms that block the cumulative disadvantage of poor children in early education that our preliminary results have demonstrated.

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