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Geographic Variations in Cost of Living: Associations With Family and Child Well-Being

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Abstract

The effects of geographic variations in cost of living and family income on children's academic achievement and social competence in first grade (mean age=86.9 months) were examined, mediated through material hardship, parental investments, family stress, and school resources. Using data from the Early Childhood Longitudinal Study-Kindergarten Cohort (ECLS-K; N = 17,565), higher cost of living was associated with lower academic achievement. For poor children only, higher cost of living was also detrimental to parental investments and school resources. Parental investments and school resources were more strongly associated with achievement for lower-income than higher-income children. Results suggest that cost of living intersects with income in meaningful ways for family and child well-being and should be accounted for in the poverty measure.

Keywords

geographic variations in cost of living; family income; achievement; social competence; parental investments; family stress; school resources; poverty measurement

Cost of living varies dramatically across the United States. For example, one month's rent for a modest two-bedroom apartment averages \$1,357 in Boston and \$551 in Frontier County, Nebraska (Department of Housing and Urban Development, 2010). Consider how a family of four with an income of \$35,000 living in Boston might experience different constraints on spending compared to a similar family living in Frontier County. How much would each family have left over after paying rent and bills, with which to purchase children's books or extracurricular activities? What psychological toll would meeting necessary household expenses have on the parents in each family? Although the literature on income and child outcomes is quite comprehensive (for a review, see McLoyd, 1998), little research has explored the influence of geographic variations in cost of living on child outcomes. The current study uses data from the Early Childhood Longitudinal Studies-Kindergarten Cohort (ECLS-K) dataset to examine the effects of geographic variations in cost of living and family income on elementary school children's academic and social outcomes. Furthermore, this study examines family and school pathways that might explain the effects of cost of living and income on child outcomes.

Geographic Variations in Cost of Living

According to bioecological theory (Bronfenbrenner & Morris, 2006), the child is influenced by proximal processes occurring within layered contexts of development, including the microsystem and macrosystem. One important macrosystem context is the cost of living of the local area where the child resides. Characteristic of macrosystems, cost of living does not influence the child directly, but rather influences the child's microsystem (i.e., parents and schools) which in turn influences child development. Geographic variations in cost of living should affect what parents are able to purchase because the same goods and services consume a larger portion of a family's income in high-cost areas than in low-cost areas. And these additional constraints on family consumption may in turn be a detriment to children's development. These relations may be particularly acute in lower-income families struggling to make ends meet. We are not aware of any empirical investigations that have examined how cost of living as a macrosystem influences a child's microsystem and in turn the child. This study aims to address this gap.

Cost of living may also contribute uniquely to family stress above and beyond indicators of financial resources. Two families may look the same in terms of income when in fact the family living in a higher-cost area may be experiencing much more stress trying to provide for their children. Living in a high-cost area imposes additional stress not captured by income because the same goods and services (e.g., rent, child care, extracurricular activities) cost more in higher-cost areas. Furthermore, living in a higher-cost area could increase a family's level of material hardship because basic necessities, including housing and food, cost more. When cost of living is not explicitly included, the stress and strain attributable to living in a high-cost area become lost as unexplained statistical noise.

Cost of living is different from other SES indicators that matter for child development, such as income and education. It is a contextual variable that is constant for all families in a defined geographical area, and that permeates every financial decision made by families in that area (although it may not influence all families equally). Cost of living is also unique because parents are not able to easily choose or manipulate their cost of living. Parents' decisions about where to live are often driven by factors including job availability and proximity to social networks. Cost of living may factor in secondarily, but only to a limited extent because neighboring areas' costs of living tend to be similar. In short, cost of living is a unique influence on child development because it is a feature of the family's context which pervades family financial decisions, yet is also a factor that many families cannot control.

Finally, cost of living is important to consider for current social policy discussions on the measurement of poverty (e.g., Citro & Michael, 1995; Roosa, Deng, Nair, & Lockhart Burrell, 2005). The current federal poverty threshold does not account for cost of living variations, and therefore assumes that a dollar buys the same goods and services in Boston as in rural Nebraska. How poverty is measured matters because being classified as poor or not (or as above or below some percent of the poverty threshold, e.g., 175%) determines whether families are eligible for food stamps, State Children's Health Insurance, and other government assistance programs. Low-income families living in high-cost areas might be unable to afford the high costs of housing, health care, and child care in their area, but at the same time be ineligible for assistance. One study estimated that within a sample of 98 central cities, if cost of living were considered, eligibility for Head Start would increase by 227,000 families, and eligibility for the National Lunch Program would increase by half a million (Curran, Wolman, Hill, & Furdell, 2008). Poverty measurements and eligibility cut-offs that take into account geographic variations in cost of living would do a better job of meeting the needs of low-income families living in high-cost areas. By examining the link

between cost of living and child development, this study will contribute to the policy discussion around including cost of living in the measurement of poverty.

Proximal Processes: Family Stress, Parental Investments, and School Resources

As explicated in the previous section, cost of living is a macrosystem factor that influences a child's microsystem. We now turn to three proximal processes within the child's microsystem – family stress, parental investments, and school resources – that mediate the relations between cost of living, family income and child well-being. We also discuss the role of material hardship within each model. See Figure 1 for a conceptual model.

The *family stress model* (Conger, Conger, & Martin, 2010; McLoyd, 1990) posits that economic hardship (i.e., income declines or living in poverty) induces economic and psychological distress (e.g., depression, parenting stress, marital conflict) in parents. Material hardship has been shown to mediate the relation between income and parent stress, such that lower income is related to increased material hardship, which in turn is related to increased parent stress (Gershoff, Aber, Raver, & Lennon, 2007; Mistry, Vandewater, Huston, & McLoyd, 2002). Parent stress in turn reduces parents' ability to interact with children in a warm, supportive manner, decreases parents' involvement and attentiveness towards their children, and increases the use of physical punishment (Conger, Elder, Lorenz, Simons, & Whitbeck, 1994; Elder, Nguyen, & Caspi, 1985). These parenting practices in turn have negative effects on child well-being. The family stress model is a well-supported model of the processes by which income matters for child well-being (Conger, et al., 2010). As discussed previously, higher costs of living should increase parent stress as families struggle to cover basic needs that cost more. When one considers two families making the same income but living in areas with drastically different costs of living, it becomes clear that cost of living can be a unique contributor to parent stress above and beyond income alone.

The *parental investment model* offers a complementary explanation of the relation between income and child well-being (e.g., Guo & Harris, 2000). In this model, higher family income enables parents to make "investments" in their children's development, and it is these investments that enhance child outcomes. Furthermore, material hardship mediates the relation between income and parent investment (Gershoff, et al., 2007). The type of investment that most strongly links income and child development is the provision of cognitively stimulating materials in the home, such as educational toys and children's books (e.g., Guo & Harris, 2000; Yeung, Linver, & Brooks-Gunn, 2002). Other types of parental investments in children include parent involvement in school and enrolling children in extracurricular activities (Gershoff, et al., 2007). According to the parental investment perspective, children in lower-income families fare less well in part because their parents cannot afford to make these types of investments. Empirical support for the parental investment model also comes from welfare policy experiments demonstrating that receipt of direct income supports increases children's enrollment in child care and other structured activities, and that these activities in turn enhance children's well-being (e.g., Huston, et al., 2001; Morris, Gennetian, & Duncan, 2005). Living in a high-cost area should constrain parental investments because basic expenses in high-cost areas consume a larger portion of the family income, leaving parents with fewer financial resources left over to make educationally-enriching investments in their children.

School resources is another important mechanism by which family income affects children's well-being. Parents with more financial resources are more likely to live in areas with higher-quality public schools or have the means to send their children to private schools.

Research also shows a high degree of correspondence between a public school's academic performance and mean family income, such that children from higher-income families tend to be concentrated in high-achieving schools (e.g., Chen & Weikart, 2008; Hochschild, 2003). Attending schools with a greater concentration of higher-achieving peers is, in turn, associated with higher levels of academic achievement (e.g., Chen & Weikart, 2008; Everson & Millsap, 2004). Thus, income may be linked to more positive child outcomes because higher incomes allow parents to send their children to higher resource schools alongside high-achieving peers. Living in a high-cost area, however, may mean that parents are less able to afford private schools and less able to live in or move to districts with more academically rigorous public schools. Likewise, experiencing more material hardship may limit parent's ability to send children to higher resource schools – parents struggling to provide a roof over the family and food on the table may have few resources to maneuver their children into high-resource schools.

In summary, family stress, parental investments, and school resources are three proximal processes within the child's microsystem that mediate the relation between income and child development, and that may also be influenced by the cost of living in the child's macrosystem.

Interactions in the Macrosystem: Cost of Living and Family Income

In addition to examining the role of cost of living and family income in the family and school process models, we also examine how cost of living and income *interact* as they play out their influence on child development. Indeed, a key component of the bioecological model is interactions taking place between macrosystem variables. For clues on how cost of living might interact with family income, we turn to well-supported findings from the income literature showing that the relation between family income and child outcomes are stronger for lower-income children and weaker for higher-income children (e.g., Dearing, McCartney, & Taylor, 2001; Duncan, Yeung, Brooks-Gunn, & Smith, 1998). In a recent study, Mistry and colleagues (2004) observed that the relation between income and child outcomes was curvilinear, with a steeper slope at lower incomes and a flatter slope at higher incomes. In the same way, the relation between cost of living and child outcomes might also be stronger for lower-income families (e.g., those earning less than 300% of the Federal Poverty Threshold) than for higher-income families. Consider that for families with lower incomes, living in a high-cost area could make necessary family expenses even more difficult to meet. Families with more financial resources, on the other hand, are more likely to have enough income to cover the expenses of living in a high-cost area. In short, cost of living and family income might interact such that the negative effects of a high cost of living on family and school processes, and indirectly on child development, is stronger for families with more limited financial resources. The current study explicitly models the interactive effects of these two components of the macrosystem – cost of living and income – to examine for whom cost of living matters most.

The Current Study

This study explores the effects of geographic variations in cost of living and family income on children's academic and social outcomes in first grade (as shown in Figure 1). The research aims are:

1. To examine whether the relations from cost of living and family income to child outcomes are explained by material hardship, family stress, parental investments, and school resources.

2. To examine whether the pattern of relations differ for children across the following family income groups: poor (income-to-needs < 1), low-income (1 ≤ income-to-needs < 3), and adequate-income (income-to-needs ≥ 3).

Method

Data

Data came from the ECLS-K dataset, a nationally representative sample of children who started kindergarten in the fall of 1998. The study was developed by the U.S. Department of Education's National Center for Education Statistics (NCES), with the goal of providing researchers and policy makers with data to answer questions about how children's home and school environments contribute to their development. The ECLS-K used multistage probability sampling: 100 primary sampling units (typically counties) were selected, from which over 1,200 public and private schools were selected, and from which students were drawn. Data were collected in kindergarten, first, third, fifth, and eighth grades, but the current study used only kindergarten and spring first grade data. Asians and Pacific Islanders were oversampled. Data were collected from children, parents, teachers, and school administrators.

The baseline data collection in the fall of kindergarten included 19,684 children. Approximately 6,000 children changed schools after kindergarten, and 50% of these "movers" were randomly selected to be followed; the rest were dropped from the sample. Additionally, 165 children were added in first grade to "freshen" the sample; these were first graders who were not enrolled in kindergarten at baseline and therefore could not have been included in the ECLS-K kindergarten sample. The result is a full NCES longitudinal sample of 17,565 children (attending 2,062 schools), and this is our analytic sample. Parent respondents were mostly (89.2%) mothers or female guardians, with most of the rest being fathers or male guardians (6.8%). Mothers were on average 33.46 years of age at baseline (SD = 6.63; see Table 1 for full sample descriptives).

Measures

Income-to-needs ratio—To obtain an income-to-needs ratio (INR), family income was divided by the federal poverty threshold from the appropriate year (1998 and 1999 thresholds were used, respectively, for kindergarten and first grade) and household size. INRs from kindergarten and first grade were averaged to capture a more accurate picture of family financial resources that is less sensitive to year-to-year income fluctuations.

Cost-of-living—Residential zip codes reported in first grade were used to match each family to a cost-of-living index value. The cost-of-living index was derived from the 2004 *Basic Family Budget* (Economic Policy Institute, 2005), which is an estimate of the minimum total cost of necessary family expenses (e.g., housing, health care, child care) in 434 Metropolitan Statistical Areas (MSAs; i.e., urban areas) and non-MSAs (i.e., rural areas). The measure captures the minimum incomes, for each MSA (and non-MSA), required to maintain a "safe and decent standard of living." The MSA with the median Basic Family Budget (which was Sioux City, Iowa, at \$39,984) was assigned a cost-of-living index of 1.0 (i.e., representing the average cost-of-living). Cost-of-living indices for all other areas were scaled proportionately (ranging from a minimum of 0.78 in rural Nebraska to a maximum of 1.62 in Boston, Massachusetts).

Material Hardship—Material hardship consisted of three measures: food insecurity, residential instability, and months of financial troubles. All constructs were constructed in the same manner as Gershoff and colleagues (2007). Food insecurity was measured in

kindergarten (not assessed in 1st grade) using the US Department of Agriculture's (USDA) Household Food Security Scale (Bickel, Nord, Price, Hamilton, & Cook, 2000). The scale assesses the extent to which food scarcity or hunger was experienced due to financial constraints within the last 12 months, and scores ranged from 0 (*food secure*) to 10 (*food insecure with severe hunger*). Residential instability represents the number of times a child has moved between birth and the spring of 1st grade, and was calculated by taking the number of places a family has lived since birth (reported in 1st grade), and subtracting one. Financial troubles were reported by parents in kindergarten (not assessed in 1st grade) as the number of months of financial trouble the family had experienced since the child's birth.

Family and school process mediators—Indicators of family and school process mediators, described below, were later combined into latent variables as described in the results.

Family stress: The family stress pathway included two constructs: parent stress and parenting practices (refer to Figure 1). Both were assessed from parent interviews.

Parent stress: The construct of parent stress included parental depression, parenting stress, and marital conflict. Because these constructs were not assessed in first grade, kindergarten measures were used as proxies. Parental depression was measured using a short form (Ross, Mirowsky, & Huber, 1983) of the Center for Epidemiology Studies-Depression measure (CES-D; Radloff, 1977), which has been validated on men and women and across racial/ethnic groups. The measure consisted of 12 items that respondents rated on a scale from 0 (*never*) to 3 (*most of the time*), which were summed to obtain a scale score ($\alpha = .86$). Example items are “could not shake off the blues” and “everything you did was an effort.”

Parenting stress was measured using seven items from the Parental Attitudes Towards Childrearing Scale (Easterbrooks & Goldberg, 1990). All items were rated on a scale from 1 (*completely true*) to 4 (*not at all true*). Example items are “child does things that really bother me” and “child seems harder to care for than most.” Items were reverse-coded and averaged to create scale scores of parental stress where higher values indicate more stress ($\alpha = .67$).

Marital conflict was made up of two scales assessing shared positive behaviors and arguments, and one item assessing marital satisfaction. This composite is similar to the marital conflict construct used by Gershoff and colleagues (2007). The positive behaviors scale included 5 items rated from 1 (*less often than twice a month*) to 4 (*almost everyday*), and included items such as “laugh together.” This scale was reverse-coded such that higher values indicated fewer positive behaviors ($\alpha = .72$). The arguments scale included 10 items (e.g., “argue about children”) rated from 1 (*often*) to 4 (*never*). The items were reverse-coded such that higher values indicated more arguments ($\alpha = .76$). The marital satisfaction item was on a scale from 1 (*very happy*) to 3 (*not too happy*), but was rescaled to a 4-point scale (e.g., a value of ‘1’ was rescaled to ‘1.33’) to give it the same scale as the shared positive behaviors and arguments scales. The positive behaviors scale, arguments scale, and marital satisfaction item were averaged together to create the marital conflict composite, where higher values indicate more conflict ($\alpha = .63$).

Parenting practices: The construct of parenting practices included parental warmth, physical punishment, cognitive stimulation, and rules and routines, and was modeled after the parenting practices construct created by Gershoff and colleagues (2007). The physical punishment, warmth, and cognitive stimulation scales were each composed of items from the Home Observation for Measurement of the Environment scale (HOME; Caldwell & Bradley, 1984), a well-established measure that has been validated across racial/ethnic

groups and varying levels of socioeconomic status. Warmth and physical punishment were assessed in kindergarten (not assessed in 1st grade); cognitive stimulation and rules and routines were assessed in 1st grade.

Parental warmth consisted of six items such as “warm, close times together,” and was rated on a scale from 1 (*completely true*) to 4 (*not at all true*). The items were reverse-coded and averaged such that higher values reflect greater warmth ($\alpha = .58$). Although the reliability of these parental warmth items is lower than we would have liked, we elected to include it for theoretical reasons and because of its significant loading on the parenting practices latent variable (described in the results).

The physical punishment scale was constructed using the same method as Gershoff and colleagues (2007). One item assessed the frequency with which the child was spanked during the last week, and responses ranged from 0 to 30. These responses were recoded on a scale from 0 (did not spank last week) to 3 (three or more times last week). Another item asked what the parent would do if the child were to hit them, and provided 11 response options which were recoded on a continuous scale of 0 to 3 based on the severity of punishment. For example, a “3” was assigned if a parent would “spank him/her” or “hit him/her back,” and a “0” was assigned if the most severe punishment was to “make him/her apologize.” The frequency of spanking and the severity of punishment score were then averaged for a composite physical punishment score.

Home cognitive stimulation included nine items which parents responded to on a scale from 1 (*not at all*) to 4 (*everyday*). Example items include “tell stories,” “sing songs with child,” and “involve child in household chores.” The items were averaged together to create the home cognitive stimulation composite score ($\alpha = .72$).

The rules and routines composite was created by summing six dichotomous items (range is 0 to 6): three about rules for watching television, two about eating breakfast and dinner at regular times more than half the week, and one about having a regular bedtime.

Parental investments: The parental investments construct included children’s extracurricular activities, parents’ school involvement, number of children’s books in the home, and whether children have access to a computer at home, all assessed in the first grade parent interview. Extracurricular activities and parent involvement were comprised of items taken from the HOME scale (Caldwell & Bradley, 1984). Children’s involvement in extracurricular activities included six items, such as “organized athletic activities” and “art classes.” The number of activities in which the child had participated were summed (range is 0 to 6).

Parent involvement in school included six items regarding whether, since the beginning of the school year, parents had attended events such as “open house or back-to-school night,” “parent-teacher conference,” “or “a school or class event, such as a play, sports event, or science fair.” The number of events attended by parents were summed (range is 0 to 6).

Parental investments also included the number of children’s books in the home (including library books) and whether children had access to a computer at home, both assessed in first grade. Number of books was log-transformed because the original distribution was skewed.

School resources: The school resource construct included aggregate SES, aggregate achievement, and Title I status, each assessed in first grade. Aggregate SES was the mean SES composite score of all sample students in a school; the SES composite score was computed by NCES by averaging the z-scores of family income, mother and father’s

education, and mother and father's occupational prestige coded using categories from the Standard Industrial Classification Manual (Office of Management and Budget, 1980). Aggregate achievement was the mean direct assessment scores (converted into z-scores) for reading, mathematics, and general knowledge (described in the following section) of all sample students in a school. Finally, Title I status of the school was obtained from school administrators.

Child outcomes—Children's academic achievement and social competence were assessed in first grade, and these were combined into latent variables as described in the results.

Academic achievement: Native Spanish speakers who did not pass an English language screener were administered a Spanish version of the mathematics assessment, but were not assessed in language and literacy. Children who spoke a language other than Spanish were not administered any direct cognitive assessments. Only 343 children did not pass the English screener.

Children's academic achievement were assessed via direct child assessments in the areas of language and literacy (reading), mathematical thinking, and general knowledge, using tests developed specifically for the ECLS-K. For each direct assessment, the child first received a 12-to 20-item routing test and, based on their performance, children were then routed to receive assessments of low, medium, or high difficulty levels. Item Response Theory (IRT) was used to generate scores (thetas). The reading test assessed basic skills (e.g., print familiarity, word recognition), receptive vocabulary, and comprehension (reliability of theta = .97). The mathematics test assessed conceptual knowledge, procedural knowledge, and problem solving, including items on number sense, number properties, operations, measurement, geometry, and data analysis (reliability of theta = .94). The general knowledge test assessed children's understanding of the social and physical world, such as the ability to form questions about the natural world and knowledge on history and government (reliability of theta = .89).

Children's academic achievement also came from teacher reports of children's proficiency in reading, mathematics, and general knowledge using the Academic Rating Scale (ARS), developed specifically for the ECLS-K. Teachers rated each child on a scale from 1 (*not yet*) to 5 (*proficient*). The reading ARS (9 items) included expressing ideas and understanding or interpreting a story ($\alpha = .94$). The mathematics ARS (7 items) included understanding place values and using measuring tools ($\alpha = .94$). The general knowledge ARS (6 items) included skills and knowledge in social studies and science ($\alpha = .95$).

Social competence: Teachers reported on children's social competence using items adapted from the Social Skills Rating System (SSRS; Gresham & Elliot, 1990). The SSRS has been validated on a sample diverse with respect to race/ethnicity and socioeconomic status. There were three subscales – Approaches to Learning, Self-Control, and Interpersonal Skills – rated on a scale from 1 (*never*) to 4 (*very often*), or no opportunity to observe behavior. The Approaches to Learning subscale included six items, such as the child's attentiveness and task persistence ($\alpha = .89$). The Self-Control subscale included four items such as the child's ability to control temper ($\alpha = .80$). The Interpersonal Skills subscale included five items such as the child's skill in forming and maintaining friendships ($\alpha = .89$).

Covariates—Analyses included the following child covariates: gender (boy = 1), race/ethnicity (reference group is White), whether child is a first-time kindergartner (yes = 1), and age at 1st grade assessment. Family covariates were highest levels of mothers' and fathers' education (from 1 'below 9th grade' to 9 'doctorate/professional'), mothers' and fathers' employment status (full time or part time, with not employed as the reference

group), immigrant status (i.e., children who are foreign-born or have at least one foreign-born parent), family structure (single or cohabiting, with married as the reference group), and urbanicity (urban fringe/large town or small town/rural, with central city as the reference group). Teacher covariates were highest level of education (from 1 'high school diploma or associate's degree' to 5 'doctorate'), years of teaching experience, and teacher certification (yes or no).

Analytic Strategy

We used latent variables within a structural equation modeling (SEM) framework for all study analyses. Using latent variables allows for data reduction while also taking into account measurement error (Kline, 2005). SEM is a comprehensive framework which allows multiple relations to be estimated simultaneously, and is ideal for testing models with sequential relations. SEM also estimates indirect (i.e., mediated) effects in one step (Stage, Carter, & Nora, 2004). Figure 1 shows the modeled relations among cost of living, INR, material hardship, family and school processes, and child outcomes. All analyses were performed using *Mplus v5* (Muthen & Muthen, 1998-2006).

To assess how well the hypothesized model fit the data, we used several goodness-of-fit indices. Significant chi-square values indicate poor model fit, but are less useful for large samples for which the chi-square is almost always significant. The comparative fit index (CFI; Bentler, 1990) ranges from 0 to 1, with values above .90 generally regarded as indicating reasonably good fit (Hu & Bentler, 1999). A root mean square error of approximation (RMSEA; Browne & Cudeck, 1993) smaller than .05 indicates close approximate fit, and smaller than .08 indicates reasonable fit.

Missing data was handled using Full Information Maximum Likelihood methods (FIML; Arbuckle, 1996). Rather than imputing values for missing data, this method fits the model being tested directly onto the nonmissing data for each participant. Given the nested nature of the data, standard errors were adjusted by specifying the appropriate stratification (Y2COMSTR) and cluster (Y2COMPSU) variables provided by NCES (Tourangeau, Nord, & Atkins-Burnett, 2006) within Mplus. The appropriate weight (Y2COMW0) was applied so that findings could be generalized to the population of children enrolled in kindergarten in 1998, and furthermore the weight accounts for the 50% of "movers" who were randomly selected to be dropped. The estimation method used was maximum likelihood with robust standard errors (MLR) because it is robust to violations of normality.

Results

We began by estimating the latent variables (i.e., factors) to be used in the structural model. All factor loadings were significant and in the expected directions (see Table 2), and the latent variable models exhibited adequate to good fit to the observed data. Next, we estimated the measurement and structural pathways for the full sample as a baseline model. Finally, we used multiple-group analysis to estimate the full model separately for each of three income groups (poor, low income, adequate income), comparing parameter estimates across income groups.

Full-Sample Structural Model

We first estimated baseline relations between INR, cost of living, material hardship, family and school processes, and child outcomes for the full sample. Correlations were modeled between variables at the same level (between all exogenous variables, between all mediators, and between all child outcomes). Child, family, and teacher covariates were

included as exogenous predictors onto all model constructs. The model had 1,130 missing data patterns, suggesting that there were no systematic missing data patterns.

Cost of living was not related to material hardship or any family and school process constructs. Higher cost of living was however directly related to lower academic achievement ($\beta = -.05$; $p < .01$). Higher levels of INR were related to lower levels of material hardship ($\beta = -.27$; $p < .001$), as expected, and material hardship in turn predicted lower levels of parental investments ($\beta = -.16$; $p < .001$), more parent stress ($\beta = .69$; $p < .001$), and lower school resources ($\beta = -.07$; $p < .01$). Higher levels of INR were also related to higher parental investments ($\beta = .16$; $p < .001$) and school resources ($\beta = .31$; $p < .001$) and, unexpectedly, to higher levels of parent stress ($\beta = .11$; $p < .001$). With a couple of exceptions, these processes predicted academic achievement and social competence in the expected directions. Unexpectedly, after accounting for all other modeled relations and the covariates, INR was negatively associated with academic achievement ($\beta = -.04$; $p < .05$). A figure with all path coefficients is available by request.

Indirect effects from cost of living and INR to children's academic achievement and social competence were estimated in Mplus with bias-corrected bootstrap standard errors. Material hardship and family and school processes mediated the relation between INR and child outcomes (but not the relation between cost of living and child outcomes), with parental investments being the strongest and most consistent mediational pathway ($\beta = .027$, $p < .001$ and $\beta = .013$, $p < .001$, respectively, for academic achievement and social competence). A table of indirect effects coefficients is available from the authors.

Further analyses were conducted to investigate four unanticipated relations: between parenting practices and academic achievement, between INR and academic achievement, between school resources and social competence, and between INR and parent stress. Results suggest that each of these unexpected relations could be attributed to suppression by other strong relations involving academic achievement, social competence, and parent stress. Detailed information on these analyses is available from the authors.

In summary, *for the full sample*, higher cost of living was related to lower academic achievement, with little evidence of mediation through material hardship or family and school processes. Cost of living was unrelated to social competence. In contrast, and consistent with prior studies, relations between INR and children's academic and social outcomes were consistently mediated through material hardship and the set of family and school processes.

Moderation by Income Category: Multiple-Group Analysis

Having established the baseline relations for the full sample, we used multiple-group analysis to examine differences in strength of relations across three income categories: poor ($n = 3,177$), low-income ($n = 7,178$), and adequate-income ($n = 6,510$) families. See Table 1 for descriptives of study variables by income category.

Multiple-group analysis has two components: testing measurement invariance (i.e., equivalence of factor loadings) and testing structural invariance (i.e., equivalence of path coefficients; Bollen, 1989). These tests each involve first conducting a preliminary omnibus test comparing the fit of two models: a fully unconstrained model, where all model parameters (e.g., path coefficients) are free to vary across groups, against a fully constrained model, where model parameters are constrained to be equal across groups. A chi-square difference test is used to compare model fit, and a significant difference in model fit indicates that one or more parameters are significantly different across groups. Further tests are then conducted to determine where the differences lie. This is done by comparing the

model fits of a series of nested models, each with successively more parameters constrained than the previous model.

With regard to measurement invariance, factor loadings for each group are shown in Table 2, and further analytical details (e.g., χ^2 difference tests) are available by request. Turning to tests of structural invariance, which are of central interest, these determine whether the strength of relations between model constructs were similar or different across poor, low-income, and adequate-income families. The fit of a fully constrained model ($\chi^2 = 15585.34$, $df = 2228$, RMSEA = .033, CFI = .824) was compared against the fit of a fully unconstrained model ($\chi^2 = 15221.63$, $df = 2180$, RMSEA = .033, CFI = .828). The rescaled chi-squared difference test revealed a significant difference in model fit, $\Delta\chi^2 = 359.98$, $df = 48$, $p < .001$.

Next we tested a series of nested models to determine which paths were different across groups. Figures 2a-c show path coefficients for each income group, and indicate which paths were significantly different across which groups. We begin by discussing relations with cost of living, income-to-needs, and material hardship. We finish by discussing relations with family and school processes.

Cost of living—To provide a quick overview, for poor children, cost of living was related to material hardship, family and school processes, and child outcomes; for low-income and adequate-income children, the influence of cost of living was much more limited. Furthermore, while higher cost of living was related to more negative family and school processes for poor children, it was actually related to more positive school processes for adequate-income children.

Cost of living was negatively related to parental investments ($\beta = -.18$) for poor children, but not significant for low- or adequate-income children; multiple-group analysis showed that this relation differed significantly for poor children versus low- and adequate-income children. Cost of living and school resources were negatively associated for poor children, ($\beta = -.11$), positively associated for adequate-income children ($\beta = .09$), and unrelated for low-income children; associations differed significantly for each group. Finally, higher cost of living was related to lower material hardship for poor children ($\beta = -.15$), but was not significant for low- or adequate-income children; associations differed significantly for poor versus other children.

With regard to direct effects from cost of living to child outcomes, the strength of associations between cost of living and academic achievement and social competence were not significantly different across the three income groups.

INR—Whereas for poor children, INR was related only to school resources, for low- and adequate-income families, INR was related to all three family and school processes. Higher INR was related to higher levels of parental investments for low- ($\beta = .16$) and adequate-income children only ($\beta = .14$), and the relation was stronger for low-income children than for adequate-income and poor children. The relation between INR and parent stress was positive for low-income families ($\beta = .14$) and negative for adequate-income children ($\beta = -.06$), and this difference was significant. The unexpected positive relation between INR and parent stress for low-income families may be attributable to suppression, much like for the full sample. Higher INR was related to more school resources for all groups, although the relation was stronger for adequate-income ($\beta = .29$) than low-income children ($\beta = .21$). And finally, higher INR was related to less material hardship for all children, and the relation was stronger for poor ($\beta = -.15$) and low-income ($\beta = -.31$) children than for adequate-income children ($\beta = -.10$).

Material hardship—Multiple-group analysis showed that none of the relations between material hardship and family and school processes and child outcomes differed significantly in strength across the three income groups.

Family and school processes to child outcomes—The relation between parental investment and academic achievement mattered more for families with lower incomes: higher parental investment was related to higher academic achievement for all three groups, but the relation was stronger for poor ($\beta = .55$) and low-income children ($\beta = .60$) than for adequate-income children ($\beta = .29$). Higher parental investment was related to higher social competence for low-income ($\beta = .30$) and adequate-income children ($\beta = .12$) only, and the relation was significantly stronger for low-income children than other children.

More supportive parenting practices was related to lower academic achievement for low-income children only ($\beta = -.18$), and there was a significant difference between adequate-income children and other children. This unexpected negative relation is likely attributable to suppression, as for the full sample. Better parenting practices was related to higher social competence for adequate-income children only ($\beta = .11$), which differed significantly from low-income children.

More school resources was related to higher academic achievement for all groups, but the relation was stronger for poor children ($\beta = .37$) than for low- ($\beta = .27$) and adequate-income children ($\beta = .28$). The relation between school resources and social competence was positive for poor children ($\beta = .12$), not significant for low-income children, and negative for adequate-income children ($\beta = -.12$); poor children differed significantly from other children.

Supplementary Analysis: Poor Families Living in High-Cost versus Low-Cost Areas

The strongest associations between cost of living and the variables of interest were observed for poor children: poor children living in higher-cost areas had lower academic achievement and lower levels of parental investments and school resources. However, this could be because poor families living in high-cost areas are more sociodemographically disadvantaged than poor families living in low-cost areas. To explore this possibility, we compared poor families living in low-cost areas to those living in high-cost areas (divided using a median split) on a number of sociodemographic characteristics. Results showed that poor children living in higher-cost areas were in fact slightly more sociodemographically disadvantaged: they were more likely to be non-White, had fathers with lower levels of education, and were more likely to be from immigrant families. However, these sociodemographic differences were included in the model as covariates. That is, the finding that poor children living in high-cost areas have lower child, family, and school outcomes persists even after controlling for indicators of disadvantage. A table of sociodemographic characteristics, stratified by a median split of cost of living and by income, with significant differences noted, is available from the authors.

Discussion

A bioecological perspective (Bronfenbrenner & Morris, 2006) informs the current study's examination of how geographic variations in cost of living and family income influence children's academic achievement and social competence in first grade. We also examined how cost of living and income influence proximal processes within the child's microsystem – family stress, parental investments, and parental resources – and how these proximal processes in turn affect the child. Finally, we examined how cost of living and income, as elements of the macrosystem, interact to influence family processes and child outcomes.

For the full-sample analysis, living in a high-cost area was associated with lower levels of academic achievement. But contrary to expectations, cost of living was not related any family or school processes. Cost of living was also not related to social competence. However, consistent with expectations, the relation between family income and child well-being was partially mediated through material hardship and the parental investment, family stress, and school resources pathways; the pathway through material hardship and parental investment was the strongest and most consistent. It is worth noting that given the large number of covariates modeled onto all parts of our model, estimates of model relations are probably conservative.

More importantly, we explored interactions between two elements of the child's macrosystem: cost of living and family income. The pattern of results suggests that cost of living had a bigger negative influence on children and families who were poor: a higher cost of living was detrimental to parental investments and school resources for poor children, but not for low-and adequate-income children. This suggests that poor parents living in high-cost areas, as a consequence of spending more on basic necessities relative to their counterparts living in low-cost areas, may have had less money left over to invest in educationally-enriching materials and activities and higher-resource schools. These findings demonstrate the importance of examining associations between geographic variations in cost of living and child well-being, as well as highlighting for whom cost of living matters most.

Recall that we had expected a higher cost of living to be related to the three proximal family and school processes – specifically, that a higher cost of living would be related to higher levels of parent stress, lower levels of parental investments, and attending schools with fewer resources. Although the full-sample analysis did not support these relations, the multiple-group analysis did partially support these relations, showing that among poor families, a higher cost of living was indeed related to lower levels of parental investments and school resources. However, higher cost of living was unrelated to parent stress in all analyses. Nonetheless, overall these results demonstrate that cost of living contributed to family and child well-being in ways not captured by income alone.

An interesting finding was that living in a higher-cost area was related to *lower* school resources for poor families, but to *higher* school resources for adequate-income families. This suggests that in higher-cost areas, schools may be more economically segregated such that higher-income children attend higher-resource schools and lower-income children attend lower-resourced schools. The possibility of greater economic segregation in schooling in higher-cost areas is consistent with a study by Reeves and Bylund (2005) showing that although poverty was related to school performance overall, the relation was stronger in metropolitan and large town locations (where cost of living is higher) and weaker in small town and rural locations (where cost of living is lower).

Turning to proximal processes influencing child development, both parental investments and school resources were more strongly associated with the achievement of children with less income. Parental investments had a stronger influence on academic achievement for poor and low-income children than for adequate-income children. And school resources had a stronger influence on academic achievement for poor than for low- and adequate-income children. This is consistent with research showing that family income matters more for families with less income (e.g., Mistry, et al., 2004). Our results suggest that processes closely related to income (i.e., parental investments and school resources) also matter more for families with less income.

An unexpected finding was that for poor children, a higher cost of living was related to decreased material hardship; we had expected higher cost of living to be related to *increased*

material hardship. One possibility is that families living below the poverty line in low-cost areas may have greater access to assistance for reducing material hardship. For example, many high-cost states offer state Earned Income Tax Credits and have higher eligibility thresholds for the State Children's Health Insurance Program (State EITC Online Resource Center, 2010).

At the same time, however, assistance in higher-cost areas is probably still inadequate to meet all of a poor family's needs. Because assistance is often decided at the state level, there are opportunities for mismatch in terms of providing more benefits to families in higher-cost areas. High-cost states do not always provide more benefits; for example, California does not have a state EITC program at all. In addition, many existing subsidies are inadequate. Section 8 public housing programs in many metropolitan areas have waitlists that are several years long or closed. For example, the waitlist for Los Angeles county has been closed since 2009. And only about one-third of families eligible for childcare subsidies currently receive subsidies, partly because of inadequate resources (United States Government Accountability Office, 2010). In short, although poor families living in high-cost areas may receive more assistance to alleviate material hardship than their counterparts living in low-cost areas (as suggested by our finding that higher cost of living was related to lower material hardship for poor families), these extra benefits are unlikely to fully defray the negative effect of high costs of living on children's outcomes.

In summary, this study used bioecological theory to demonstrate how proximal processes (i.e., family stress, parental investments, and school resources) within a child's microsystem and macrosystem (cost of living and income) combine and interact to influence child development. Cost of living is a unique influence on child well-being because it pervades families' financial decisions, yet is difficult for parents to manipulate or control. This study demonstrates that cost of living influences family and child well-being in ways not captured by income alone and, if omitted, its influence would be lost as statistical noise. Finally, results show that cost of living matters most for the most vulnerable group of children – children growing up in poor families.

Limitations

An important caveat is that we cannot use findings from this observational and primarily cross-sectional study to draw causal inferences about relations between study constructs. An important next step would be to use methods such as growth curve analysis or estimating the Impact Threshold for a Confounding Variable (ITCV; Frank, 2000). These methods would speak to the extent to which relations are causal: the former by estimating effects on change (which accounts for stable omitted variables) and the latter by estimating how large omitted confounding influences would need to be to nullify observed relations. In the current study, we did attempt to strengthen the evidence for causality by including lagged kindergarten child outcomes on the first grade child outcomes. However, because associations between kindergarten and first grade were very stable (the correlation was extremely high) for the short time span of kindergarten to first grade, linear dependency prevented such a model from being run. Therefore, although the observed model relations are very stable, it is difficult to know whether they are casual relations or spurious relations attributable to selection bias.

We draw attention to two specific sources of bias: the parents and the geographical areas. With regard to parents, there might be unobserved differences between parents who actively choose to live in higher- versus lower-cost areas, and these differences could drive the relation between cost of living and child outcomes. With regard to the geographical area, there might be unobserved differences between higher- and lower-cost areas that underlie the relation between cost of living and child outcomes. However, it is important to note that

MSAs (Metropolitan Statistical Areas) are very large (recall that one cost-of-living index value is assigned to each MSA); for example, all of Washington DC is within a single MSA. Because one MSA includes many different neighborhoods, cost of living is not related to finer neighborhood-level variables such as neighborhood quality (e.g., in our data, the correlation between cost of living and neighborhood disorganization is .004). The large MSAs serve to reduce bias from between-MSA differences.

But the large size of the MSAs is also a study limitation. Living expenses – such as rent – vary within an MSA. That is, the current cost of living index is not very fine-grained and carries a lot of statistical “noise.” An index of cost of living with smaller geographical units might have revealed a stronger association between cost of living and child well-being. But although it is coarse, the current cost-of-living index is nonetheless useful because it adequately captures between-MSA variability in cost of living. For example, that it costs more on average to live in the Boston MSA than in the Los Angeles MSA is reflected in our cost-of-living index. Our index also reflects the fact that even relatively cheaper neighborhoods in Los Angeles still cost more than any neighborhood in, for example, Frontier County, Nebraska.

Implications for Policy

Although the question of how to measure poverty has been discussed for some time (e.g., Citro & Michael, 1995), there was recently a bill in Congress designed to address existing limitations and implement an improved poverty measure (Measuring American Poverty Act of 2009, H.R. 2909; S. 1625). This new measure aimed to, among other improvements, account for geographic variations in cost of living (e.g., Danziger, 2008). At a time when policy makers are seeking to incorporate cost of living into the poverty measure, this study provides timely empirical evidence that cost of living indeed matters for family and child well-being. Improving the poverty measure by accounting for cost of living would make a real difference for the many low-income children and families living in high-cost areas who do not currently qualify for the assistance they need.

In conclusion, this study provides important empirical evidence, using a nationally representative sample of children, that geographic variations in cost of living indeed matters for children’s well-being. We examined the role of cost of living within the family stress, parental investment, and school resource models, and furthermore illuminated interactions between cost of living and income, showing that cost of living mattered the most for poor children.

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Figure 1.

Conceptual model.

Note. Child, family, and teacher covariates were modeled on all model constructs. Between-level correlations were modeled but not shown. Dashed paths were not significant. P: path is different from the poor group; A: path is different from the adequate-income group. All coefficients are standardized.

* $p < .05$; ** $p < .01$; *** $p < .001$

Figure 2.

a. Poor families (INR < 1): Model of relations between income, cost of living, material hardship, family and school processes, and child outcomes.

Note. Child, family, and teacher covariates were modeled on all model constructs. Between-level correlations were modeled but not shown. Dashed paths were not significant. L: path is different from the low-income group; A: path is different from the adequate-income group. All coefficients are standardized.

* $p < .05$; ** $p < .01$; *** $p < .001$

b. Low-income families (1 < INR < 3): Model of relations between income, cost of living, material hardship, family and school processes, and child outcomes.

Note. Child, family, and teacher covariates were modeled on all model constructs. Between-level correlations were modeled but not shown. Dashed paths were not significant. P: path is different from the poor group; A: path is different from the adequate-income group. All coefficients are standardized.

* $p < .05$; ** $p < .01$; *** $p < .001$

c. Adequate-income families (INR ≥ 3): Model of relations between income, cost of living, material hardship, family and school processes, and child outcomes.

Note. Child, family, and teacher covariates were modeled on all model constructs. Between-level correlations were modeled but not shown. Dashed paths were not significant. P: path is different from the poor group; L: path is different from the low-income group. All coefficients are standardized.

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 1

Means and Standard Deviations for Study Variables

Measure	Full Sample		Poor Families (INR < 1)		Low-Income Families (1		Adequate-income Families (INR ≥ 3)	
	M or %	SD	M or %	SD	M or %	SD	M or %	SD
	n = 17565		n = 3177		n = 7178		n = 6510	
Income-to-needs ratio (INR; avg k & l)	3.02	2.55	0.61 ^a	0.25	1.92 ^b	0.57	5.41 ^c	2.56
Cost of living index	1.07	0.18	1.04 ^a	0.19	1.05 ^a	0.17	1.10 ^b	0.18
Material hardship								
Food insecurity (k)	0.59	1.54	1.57 ^a	2.28	0.64 ^b	1.55	0.09 ^c	0.57
Residential instability	1.98	1.55	2.13 ^a	1.85	2.09 ^a	1.63	1.81 ^b	1.28
Months of financial troubles (k)	4.36	11.85	8.15 ^a	16.61	5.62 ^b	12.94	1.36 ^c	5.93
Family stress								
Parent stress								
Parenting stress (1-4) (k)	1.60	0.47	1.70 ^a	0.55	1.60 ^b	0.47	1.56 ^c	0.42
Depressive symptoms (0-36 scale) (k)	5.44	5.43	7.13 ^a	6.60	5.74 ^b	5.54	4.35 ^c	4.39
Marital conflict (1-4) (k)	1.71	0.38	1.78 ^a	0.48	1.72 ^b	0.43	1.70 ^c	0.39
Parenting practices								
Warmth (1-4) (k)	3.64	0.35	3.59 ^a	0.41	3.64 ^b	0.36	3.67 ^c	0.32
Cognitive stimulation (1-4)	2.65	0.48	2.59 ^a	0.55	2.65 ^b	0.49	2.67 ^b	0.45
Physical punishment (0-3) (k)	0.86	0.66	1.00 ^a	0.78	0.89 ^b	0.68	0.77 ^c	0.57
Rules and routines (0-6)	4.93	1.14	4.69 ^a	1.29	4.91 ^b	1.14	5.07 ^c	1.05
Parental investment								
Extracurricular activities (0-6)	1.48	1.31	0.75 ^a	1.07	1.26 ^b	1.19	2.04 ^c	1.32
Parent involvement in school (0-6)	4.03	1.54	2.95 ^a	1.58	3.87 ^b	1.50	4.68 ^c	1.22
Children's books in home (item)	102.56	147.06	49.31 ^a	128.64	94.38 ^b	145.71	134.39 ^c	148.14
Have access to home computer (item)	0.67	0.47	0.29 ^a	0.46	0.62 ^b	0.49	0.88 ^c	0.32
School resources								
Aggregate SES	-0.02	0.57	-0.53 ^a	0.41	-0.14 ^b	0.44	0.38 ^c	0.50

Measure	Full Sample		Poor Families (INR <1)		Low-Income Families (1		INR <3)		Adequate-income Families (INR 3)	
	M or %	SD	M or %	SD	M or %	SD	M or %	SD	M or %	SD
	n = 17565		n = 3177		n = 7178		n = 6510			
Title I school	0.66	0.47	0.89 <i>a</i>	0.31	0.72 <i>b</i>	0.45	0.46 <i>c</i>	0.50		
Aggregate achievement	-0.01	0.54	-0.43 <i>a</i>	0.47	-0.07 <i>b</i>	0.49	0.29 <i>c</i>	0.44		
Academic achievement										
Reading direct assessment (IRT scale)	71.67	22.44	59.39 <i>a</i>	18.68	69.81 <i>b</i>	20.91	79.92 <i>c</i>	22.42		
Math direct assessment (IRT scale)	57.55	16.88	48.53 <i>a</i>	14.32	56.00 <i>b</i>	15.94	64.19 <i>c</i>	16.51		
General knowledge direct assessment (IRT scale)	34.36	7.69	28.44 <i>a</i>	7.59	33.87 <i>b</i>	7.15	38.02 <i>c</i>	6.02		
Language literacy teacher-report (scale score, 1-5)	3.44	0.91	3.04 <i>a</i>	0.92	3.40 <i>b</i>	0.91	3.70 <i>c</i>	0.83		
Math teacher-report (scale score, 1-5)	3.47	0.89	3.09 <i>a</i>	0.90	3.42 <i>b</i>	0.89	3.73 <i>c</i>	0.80		
General knowledge teacher-report (scale score, 1-5)	3.33	0.97	2.94 <i>a</i>	0.94	3.27 <i>b</i>	0.97	3.59 <i>c</i>	0.90		
Social competence										
Approaches to learning (scale score, 1-4)	3.04	0.71	2.82 <i>a</i>	0.74	3.00 <i>b</i>	0.71	3.18 <i>c</i>	0.65		
Self-control (scale score, 1-4)	3.17	0.62	3.03 <i>a</i>	0.66	3.15 <i>b</i>	0.62	3.26 <i>c</i>	0.58		
Interpersonal skills (scale score, 1-4)	3.10	0.64	2.94 <i>a</i>	0.67	3.08 <i>b</i>	0.64	3.20 <i>c</i>	0.62		
Covariates										
Gender(1=boy)	51.18%	--	50.71%	--	51.42%	--	51.18%	--		
Race/ethnicity										
White, non-Hispanic	56.43%	--	23.76% <i>a</i>	--	55.11% <i>b</i>	--	76.42% <i>c</i>	--		
Black or African American	14.23%	--	29.93% <i>a</i>	--	14.49% <i>b</i>	--	5.58% <i>c</i>	--		
Hispanic	17.47%	--	31.47% <i>a</i>	--	18.49% <i>b</i>	--	8.81% <i>c</i>	--		
Asian	6.36%	--	6.71%	--	5.74%	--	5.49%	--		
Other	5.51%	--	8.13% <i>a</i>	--	6.16% <i>b</i>	--	3.69% <i>c</i>	--		
First time Kindergartner	95.51%	--	93.34% <i>a</i>	--	95.42% <i>b</i>	--	96.57% <i>c</i>	--		
Age at 1st grade assessment (in months)	86.87	4.28	86.84	4.34	86.92	4.27	86.85	4.24		
Mother's education (1 'below 9th grade' to 9 'doct.')	4.34	1.80	2.91 <i>a</i>	1.37	3.96 <i>b</i>	1.50	5.39 <i>c</i>	1.65		
Father's education (1 'below 9th grade' to 9 'doct.')	4.50	2.02	2.76 <i>a</i>	1.50	3.85 <i>b</i>	1.62	5.55 <i>c</i>	1.91		
Parents' employment status										

Measure	Full Sample		Poor Families (INR <1)		Low-Income Families (1 INR < 3)		Adequate-income Families (INR 3)	
	M or %	SD	M or %	SD	M or %	SD	M or %	SD
	n = 17565		n = 3177		n = 7178		n = 6510	
Mother employed full time	47.79%	--	38.16% <i>a</i>	--	51.11% <i>b</i>	--	48.42% <i>c</i>	--
Mother employed part time (< 35 hours)	22.19%	--	15.64% <i>a</i>	--	20.76% <i>b</i>	--	26.54% <i>c</i>	--
Mother not employed	30.02%	--	46.20% <i>a</i>	--	28.13% <i>b</i>	--	25.04% <i>c</i>	--
Father employed full time	90.94%	--	70.17% <i>a</i>	--	91.69% <i>b</i>	--	95.33% <i>c</i>	--
Father employed part time (< 35 hours)	3.28%	--	7.80% <i>a</i>	--	3.06% <i>b</i>	--	2.38% <i>b</i>	--
Father not employed	5.78%	--	22.03% <i>a</i>	--	5.25% <i>b</i>	--	2.29% <i>c</i>	--
Immigrant (1st or 2nd generation)	25.16%	--	38.71% <i>a</i>	--	26.82% <i>b</i>	--	17.80% <i>c</i>	--
Marital status								
Two parents, married	72.69%	--	39.55% <i>a</i>	--	70.32% <i>b</i>	--	89.24% <i>c</i>	--
Two parents, cohabiting	6.41%	--	13.45% <i>a</i>	--	7.26% <i>b</i>	--	2.54% <i>c</i>	--
Single parent	20.90%	--	47.00% <i>a</i>	--	22.42% <i>b</i>	--	8.22% <i>c</i>	--
Urbanicity								
Central city	39.44%	--	50.40% <i>a</i>	--	38.84% <i>b</i>	--	33.95% <i>c</i>	--
Urban fringe and large town	39.19%	--	26.88% <i>a</i>	--	35.43% <i>b</i>	--	49.29% <i>c</i>	--
Small town and rural	21.37%	--	22.72% <i>a</i>	--	25.73% <i>b</i>	--	16.76% <i>c</i>	--
Teacher's highest education level (1 'HS/AA' to 5 'doct.')	3.11	0.94	3.10 <i>a</i>	0.93	3.08 <i>a</i>	0.93	3.15 <i>b</i>	0.94
Teacher experience (years)	14.41	10.10	13.47 <i>a</i>	10.06	14.53 <i>b</i>	10.17	14.81 <i>b</i>	9.98
Teacher is certified	88.73%	--	88.81%	--	89.26%	--	88.37%	--

Note. Measures were collected in first grade, unless otherwise indicated.

abc Different subscripts denote values that are significantly different to at least $p < .05$.

Table 2

Latent Variable Factor Loadings for the Full Sample and by Income Category

	Full Sample		Poor Families (INR < 1)		Low-Income Families (1 INR < 3)		Adequate-income Families (INR ≥ 3)	
	λ	S.E.	λ	S.E.	λ	S.E.	λ	S.E.
Material hardship (k & 1st) →								
Food insecurity (k)	0.39	0.04	0.28	0.06	0.62	0.07	0.62	0.06
Residential instability (1st)	0.31	0.03	0.38 ^a	0.08	0.18 ^b	0.04	0.13 ^c	0.03
Months of financial troubles (k)	0.65	0.05	0.58 ^a	0.11	0.36 ^b	0.05	0.35 ^b	0.05
Parental investments (1st) →								
Extracurricular activities	0.56	0.01	0.37	0.04	0.40	0.02	0.30	0.01
Parent school involvement	0.62	0.02	0.47 ^a	0.03	0.52 ^a	0.02	0.43 ^b	0.02
Number of children's books	0.63	0.01	0.52 ^a	0.03	0.57 ^a	0.02	0.45 ^b	0.02
Home computer	0.55	0.02	0.36 ^a	0.04	0.44 ^b	0.02	0.46 ^a	0.01
Parent stress (k) →								
Parenting stress	0.52	0.02	0.63	0.04	0.60	0.02	0.47	0.02
Parental depression	0.58	0.04	0.43 ^a	0.06	0.42 ^a	0.03	0.59 ^b	0.02
Marital conflict	0.49	0.02	0.56 ^a	0.06	0.49 ^a	0.03	0.45 ^b	0.02
Parenting practices (k & 1st) →								
Warmth (k)	0.44	0.02	0.49	0.03	0.53	0.03	0.45	0.03
Cognitive stimulation (1st)	0.60	0.03	0.58 ^a	0.05	0.46 ^b	0.03	0.33 ^b	0.03
Physical punishment (k)	-0.22	0.02	-0.27 ^a	0.04	-0.29 ^a	0.03	-0.35 ^b	0.02
Rules and Routines (1st)	0.32	0.02	0.34 ^a	0.04	0.24 ^b	0.03	0.28 ^a	0.02
School resources (1st) →								
Aggregate SES	0.91	0.01	0.76	0.06	0.90	0.02	0.83	0.02
Title I	-0.58	0.01	-0.38 ^a	0.04	-0.47 ^b	0.02	-0.47 ^b	0.01
Aggregate achievement	0.81	0.01	0.71 ^a	0.06	0.64 ^a	0.02	0.70 ^b	0.02
Academic achievement (1st) →								
Direct assessment: Reading	0.80	0.01	0.80	0.02	0.79	0.01	0.70	0.01
Direct assessment: Math	0.86	0.01	0.85	0.02	0.83	0.01	0.75	0.01
Direct assessment: General knowledge	0.73	0.01	0.60	0.02	0.69 ^a	0.01	0.75 ^b	0.01
Teacher report: Reading	0.68	0.01	0.66 ^a	0.02	0.69 ^a	0.01	0.64 ^b	0.01

	Full Sample		Poor Families (INR < 1)		Low-Income Families (1		INR < 3)		Adequate-income Families (INR > 3)	
	λ	S.E.	λ	S.E.	λ	S.E.	λ	S.E.	λ	S.E.
Teacher report: Math	0.66	0.01	0.62 ^a	0.02	0.65 ^a	0.01	0.61 ^b	0.01	0.61 ^b	0.01
Teacher report: General knowledge	0.57	0.01	0.52	0.03	0.57	0.02	0.54	0.01	0.54	0.01
Social competence (1st) →										
Approaches to learning	0.74	0.01	0.76	0.02	0.75	0.01	0.76	0.01	0.76	0.01
Self-control	0.87	0.01	0.86	0.01	0.86	0.01	0.87	0.01	0.87	0.01
Interpersonal skills	0.93	0.00	0.93	0.01	0.93	0.01	0.90	0.01	0.90	0.01

Note. Different subscripts indicate path loadings that are significantly different, as indicated by chi-square difference tests. All factor loadings were significant to $p < .001$.