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Family and Community Resource and Stress Processes Related to Income Disparities in School-Aged Children's Development

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Income disparities in children's academic and behavioral skills have grown larger over the past 50 years. At the same time, economic segregation across communities has increased, raising questions regarding the role of community factors in explaining income gaps in children's functioning. Combining geospatial data with longitudinal survey data from the Early Childhood Longitudinal Study-Kindergarten Cohort of 2010–2011, an ethnically diverse, nationally representative sample of kindergarteners ($N \approx 17{,}600$), this project explored how differences in community- and family-level resources and stressors help to explain family income gaps in achievement, executive functioning, and externalizing behaviors in third grade (age 9). Family income had small to medium associations with more community resources and fewer community stressors, which in turn exhibited small associations with parenting practices. These relations helped explain income gaps in children's functioning. Results have implications for researchers and practitioners focused on narrowing economic skills gaps as well as housing and community planning efforts designed to foster children's positive development.

Educational Impact and Implications Statement

Communities are becoming increasingly segregated by household income, raising questions regarding the role of community factors in explaining income gaps in children's functioning. This project used geospatial data to explore how differences in community- and family-level resources and stressors help to explain income gaps in achievement, executive functioning, and externalizing behaviors in third grade (age 9). Family income was associated with more community resources and fewer community stressors. These community factors, both directly and through their links to parenting, partially explained income gaps in children's functioning. These findings are useful for researchers and educators aiming to narrow skills gaps related to family income as well as housing and community planners working with low-income families.

Keywords: income disparities, community context, achievement, externalizing

The income-achievement gap grew by 40% between the 1970s and 1990s, becoming nearly twice the size of the Black-White achievement gap (Reardon, 2011). Although there are some indications that income-achievement gaps may have diminished in the past decade, they remain large, and disparities in behavior problems have widened (Reardon & Portilla, 2016; Magnuson & Duncan, 2016). This growth has occurred despite skills gaps being the focus of immense research and policy attention to redress them (Reardon, 2011). Academic and behavioral gaps related to family income are large in elementary school and portend continued disparities in educational achievement and attainment, as well as adult employment, earnings, and psychosocial functioning (Dekker et al., 2007; Duncan et al., 2008, 2014; Jäntti, 2009). Thus, it is essential to delineate the processes that give rise to disparities in children's academic and behavioral development as children progress through the early years of school. The early emergence of developmental disparities related to family income and the consistency of these differences as children progress through school points to families and communities as key contexts driving economic gaps in child development (Reardon & Portilla, 2016).Yet, largely separate

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literatures have emerged. One documents the roles of family processes, including investments, stressors, and parenting (e.g., Bassok, Finch, Lee, Reardon, & Waldfogel, 2016; Bradley, Convyn, Burchinal, McAdoo, & Garcia Coll, 2001; Coley, Carrano, & Lewin-Bizan, 2011; Kalil & Mayer, 2016) and, while the other highlights the influence of neighborhood characteristics in explaining links between income and children's development (e.g., Leventhal, Dupéré, & Shuey, 2015; McCartney, Dearing, Taylor, & Bub, 2007; Sampson, Sharkey, & Raudenbush, 2008). However, there is a need for a more integrated and conceptually rich approach—one that attends to the multiple contexts within which child development unfolds and recognizes interconnections across these contexts.

In recent decades, the U.S. has experienced rising inequality across multiple dimensions of family life. First, income inequality and wealth concentration have increased, with accelerating levels of affluence, high rates of poverty, and declines in the size and stability of the middle class (Stone, Trisi, Sherman, & DeBot, 2015). From 1970 to the present, the share of aggregate income going to middle-class households fell from 62 to 43%, while the share flowing to lower-income households remained stagnant at about 10%. At the same time, the share held by upper-income households increased from 29 to 48% (Pew Research Center, 2020). Moreover, current levels of income inequality and child poverty in the United States are among the highest within wealthy countries across the world (Saez & Zucman, 2014), with 24% of children under age 9 living in poverty in the United States in 2013 (Ekono, Yang, & Smith, 2016). Second, inequality has become more geographically concentrated, with Americans inhabiting economically segregated communities at higher rates than 50 years ago (Bischoff & Reardon, 2013; Pendall & Hedman, 2015). In 1970, only 15% of all families lived in neighborhoods characterized by highly concentrated advantage or disadvantage, whereas 65% lived in middle-income neighborhoods. Today, more than one third of families live in either affluent or poor neighborhoods, and the proportion living in middle-income neighborhoods has declined to 40% (Bischoff & Reardon, 2013).

The overarching goal of this study is to strengthen knowledge of the family and community processes through which income relates to children's early learning and behavioral skills, as well as the interplay between such processes. This study merges nationally representative data from the Early Childhood Longitudinal Study Kindergarten Cohort of 2010–2011 (ECLS-K: 2011) with geocoded data derived using innovative mapping techniques to examine how resources and stressors at the family and neighborhood-levels shape early learning and behavioral development during elementary school. It focuses on child outcomes data assessed in third grade, because prior studies suggest that academic skills measured in third grade are strong predictors of subsequent educational achievement and attainment (Hernandez, 2011; Lesnick, Goerge, Smithgall, & Gwynne, 2010; McClelland, Acock, & Morrison, 2006).

Mechanisms Linking Family Income to Children's Development

Bioecological models of child development guide this study and argue that proximal processes unfolding across multiple contexts, including families and neighborhoods, drive children's development (Bronfenbrenner & Morris, 2006). Particularly important for promoting children's cognitive and socioemotional development are warm, nurturing, and stimulating interactions that take place consistently over time in children's most immediate surroundings: their microsystems (Bronfenbrenner & Morris, 2006). Microsystems include children's home environments as well as more distal neighborhoods, which exert independent effects on children's development, as children interact with people, objects, and environments within the microsystem. Additionally, neighborhoods may serve as exosystems for children, which are contexts that children may not directly engage in, but affect children indirectly through caregivers (Bronfenbrenner, 1979). In addition to directly shaping children's development, effects of neighborhoods may trickle down through interactions between caregivers and children. For example, prior studies suggest that characteristics of neighborhoods may relate to parenting practices, as parents adjust their child rearing behaviors in response to resource availability or threats to safety within a community (Caughy & O'Campo, 2006; McCartney et al., 2007; Roche & Leventhal, 2009). Thus, our conceptual model (see Figure 1) theorizes that the parenting and neighborhood microsystems will have direct links to child outcomes, and neighborhood factors will also serve as an exosystem for children's development by shaping parenting, which in turn influences academic and behavioral development. Within this framework, leading theories argue that income is a resource that families possess that shapes learning opportunities and development through two fundamental proximal mechanisms: resource/investments and stress processes that occur both within the home and neighborhood.

Resources and Investments

According to resource and investment theories, income dictates the time and money caregivers invest in children. Poor children receive fewer family investments than their wealthier counterparts, and this can hinder their early skills development (Becker, 1991; Duncan, Magnuson, & Votruba-Drzal, 2017). Parents invest in children by providing cognitive stimulating materials and interactions, educational activities and involvement, and warm and sensitive caregiving, all of which help to promote children's early learning, cognitive skills, and behavioral development (Bradley et al., 2001; Coley, Lewin-Bizan, & Carrano, 2011; Kalil & Mayer, 2016; Votruba-Drzal, 2006). Differences in these investments help explain why economically disadvantaged children tend to lag behind their more advantaged peers in academic skills development and exhibit more maladaptive behaviors (Votruba-Drzal, 2006). New research suggests growing economic disparities in families' provision of cognitive stimulation and quality early education opportunities (Bassok et al., 2016), but has not linked these shifts to children's skills.

Other resources that are essential for supporting young children's development occur at the neighborhood-level. These include educational and cultural resources, social and health services, and recreational facilities, which provide enrichment to children and enhance parents' ability to effectively invest in their children (e.g., Fredricks & Eccles, 2006; Gormley & Gayer, 2005). For example, families living in communities with higher availability of early child education (ECE) programs are more likely to enroll their child in quality ECE, in turn promoting children's

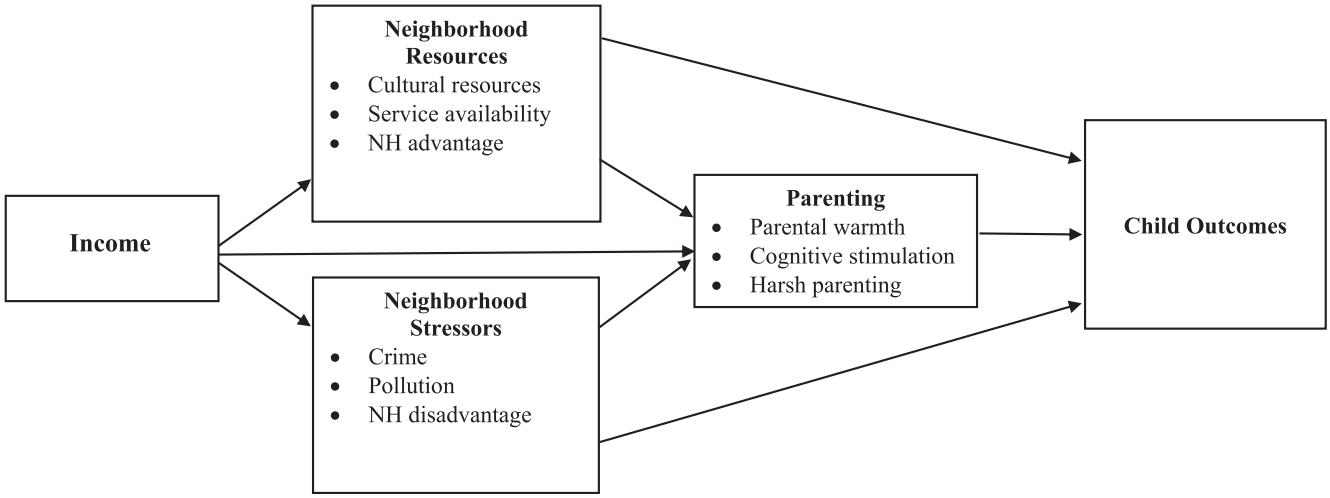

Figure 1. Conceptual model. U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Kindergarten Class of 2010–11 (ECLS-K: 2011).

cognitive competencies as they enter kindergarten (Coley, Votruba-Drzal, Collins, & Miller, 2014; Miller & Votruba-Drzal, 2014; Votruba-Drzal, Coley, Koury, & Miller, 2013). Parents use community resources like libraries, museums, and family resource centers to provide better and a greater diversity of stimulating and responsive experiences to their children (e.g., McCartney et al., 2007). Additionally, access to nature and green spaces support children's attention skills and interpersonal functioning and is linked to reductions in behavior problems (Taylor & Kuo, 2006; Wells & Evans, 2003). Heightened neighborhood access to social and cultural capital, which tends to be concentrated in more socioeconomically advantaged neighborhoods, also enhances children's skills (Leventhal et al., 2015; Sampson et al., 2008). For instance, prior studies have shown that neighborhood socioeconomic advantage, which we conceptualize as a community-level resource, enhances children's academic skills development through greater cognitive stimulation in the home environment (Dupéré, Leventhal, Crosnoe, & Dion, 2010; Klebanov, Brooks-Gunn, Chase-Lansdale, & Gordon, 1997; Klebanov, Brooks-Gunn, McCarton, & McCormick, 1998). Finally, access to important community resources utilized by families, like medical services and social services, is linked to reductions in parental distress and harsh and neglectful parenting (e.g., Maguire-Jack & Negash, 2016).

Family and Environmental Stress Theories

Family stress theory, which was first put forth in Elder's (1974) pioneering work in *Children of the Great Depression*, argues that low income families experience intense economic pressure as they struggle to make ends meet in the context of limited resources. This stress undermines parents' psychological well-being and diminishes parenting practices in the home environment, with more distressed parents evincing less warm, stimulating, and responsive parenting and more harsh, punitive, detached, and inconsistent parenting (Goodman & Gotlib, 1999; Kessler & Cleary, 1980; Lovejoy, Graczyk, O'Hare, & Neuman, 2000; McLeod & Kessler, 1990). Such practices compromise children's academic skills and place them at greater risk for emotional and behavioral problems (Conger et al., 2002; McLoyd, 1990; Votruba-Drzal, 2006). New research has delineated how these stress processes may function directly through greater and prolonged activation of the stress response system (Kim et al., 2013; Shonkoff, 2010), and indirectly through parental distress and impaired parenting (Coley et al., 2013, 2015; Conger et al., 2002; Evans & Kim, 2012; Shelleby et al., 2014).

Economic disparities in exposure to stress extend beyond the family to the broader neighborhood. Neighborhood stress stems from exposure to crime and violence (Ludwig et al., 2012; Sampson, 2012) as well as heighted exposure to pollutants and toxins due to traffic, farming, landfills, and natural resources extraction, as well as less exposure to nature and green spaces (Burton, Lichter, Baker, & Eason, 2013; Cutrona, Wallace, & Wesner, 2006; Evans, 2004). These neighborhood stressors may affect children directly, such as when exposure to lead and other toxins impairs cognitive and behavior development (Evans, 2006; Harris et al., 2016). Conversely, the effects may be indirect, such as when neighborhood stressors affect parental distress and, in turn, parenting, which can inhibit children's behavioral and cognitive development (Caughy & O'Campo, 2006; Coley, Lynch, & Kull, 2015; Evans, 2006; Roche & Leventhal, 2009; Sharkey, 2010; Vaden-Kiernan et al., 2010). Neighborhood socioeconomic disadvantage may also engender maladaptive community norms. For instance, parents living in more socioeconomically disadvantaged neighborhoods are more likely to spank their children (Miller, Votruba-Drzal, & Coley, 2019). Children growing up in more disadvantaged communities also have a greater propensity to affiliate with deviant peers and evince higher levels of conflict with their parents, which are linked to elevations in behavior problems (e.g., Brody et al., 2001; Ingoldsby et al., 2006).

Current Study

While prior literature provides strong evidence to support the contributions of family and community processes, that work has typically focused on processes at *either* the family-level *or* the

community-level without directly attending to the embedded and mutually influential nature of these contexts or to the complex breadth of environmental forces (for exception see Fan & Chen, 2012). Moreover, studies have generally considered resource/investment processes and stress processes separately, instead of incorporating both into their models. This is problematic given that resources and stressors are often correlated and may have combined importance for young children's early skills development (Vernon-Feagans et al., 2013; Yeung, Linver, & Brooks-Gunn, 2002). This study will advance the field by delineating the combined roles of family and community contexts in income disparities in child development through a consideration of both resource and stress processes operating at multiple levels. Finally, this study makes methodological advances to the literature by combining longitudinal data on family income and children's development drawn from the ECLS-K: 2011 with a rich trove of neighborhood-level administrative data. This combination of data provides a unique opportunity to create a rich and detailed view of the contextual processes linking family income with children's early skill development.

Research Aims and Hypotheses

This study aimed to delineate the pathways through which family income shapes children's development in elementary school by examining the roles of resource and stress processes that unfold in family and community contexts. Drawing on bioecological theory and resource and stress models as well as empirical evidence of these models from the literature, we hypothesized that family income would enhance children's cognitive and behavioral skills through greater resource availability and lower stress exposure in community contexts. These, in turn, would promote greater parental investments and lower levels of stress-driven parenting behaviors, thereby enhancing cognitive and behavioral skills. To test these hypotheses, we assessed the conceptual model presented in Figure 1 in a large, nationally representative sample of children from the ECLSK: 2011 followed from kindergarten through third grade. In estimating this model, we tested for indirect associations between income and children's skills that run through community characteristics and parenting processes.

Method

Participants and Procedure

Data on children and families were drawn from the ECLS-K: 2011, which followed a nationally representative cohort of children entering kindergarten in the fall of 2010 through their elementary school years. It is a multisource, multimethod study that focuses on children's early home and school experiences. Data were collected twice a year during the fall and spring of kindergarten, first grade, and second grade and annually thereafter from parents, teachers, school administrators, and via direct child assessments. Response rates for Waves 1 through 7 were 87, 85, 89, 88, 84, 87, and 84%, respectively. This study includes approximately 17,600 children who had valid kindergarten sampling weights.[1] It focuses on child outcomes data assessed in third grade, because academic and cognitive skills measured at this time show strong linkages subsequent educational achievement and attainment (Hernandez, 2011; Lesnick et al., 2010; McClelland et al., 2006).

Among the sample there was approximately 1,300 children who were identified as having a disability. The most common types of disabilities were learning disabilities, language impairments, and other health impairments. The ECLS-K excluded children with severe disabilities ($n \approx 100$) from direct assessments; these children were excluded from our analytic sample. For the remaining roughly 1,200 children with disabilities, field supervisors made accommodations necessary to appropriately administer the direct child assessment battery, so that the study could be as inclusive as possible. These children are included in all of analyses to strengthen the external validity of our findings.

Table 1 presents descriptive data on the analytic sample. Children were diverse in terms of race/ethnicity: 52.2% of the sample was White, 13.3% Black, 3.8% Asian, 25.0% Latino, and 5.7% other or mixed race. About a quarter of the children were born to one or more immigrant parents. Similarly, there was socioeconomic diversity in the sample, with variability in both income and parental education. Lastly, children were scattered across the United States.

Measures

Child outcomes. Children's knowledge and skills in reading and math were measured with direct assessments at Wave 7 (spring of third grade). The assessments drew items from several well-validated, standardized instruments to create reliable, age-appropriate composites of reading ($\alpha = .87$) and math ($\alpha = .92$) skills scored using Item Response Theory (IRT) procedures (Tourangeau et al., 2018). The reading assessment included questions measuring basic skills (e.g., word recognition), vocabulary knowledge, and reading comprehension. The math assessment was designed to measure skills in conceptual knowledge, procedural knowledge, and problem solving. An achievement composite was created by standardizing and averaging the reading and math scores, because they were highly correlated ($r = .73$) and we had no a priori hypotheses that were specific to these two domains of academic achievement.

The ECLS-K: 2011 also obtained direct assessments of children's executive functioning skills at Wave 7 via the Dimensional Change Card Sort (DCCS; Zelazo, 2006) and the Numbers Reversed task (Tourangeau et al., 2018). The DCCS collects information of children's cognitive flexibility through their ability to follow changing sorting rules quickly and correctly. The Numbers Reversed measure assesses working memory through children's ability to repeat series of numbers in backward order. Scores on these two tasks were standardized and averaged to create an executive functioning composite ($r = .40$).

Children's externalizing behavior problems were assessed through teacher reports. At Wave 7, teachers rated children's behavioral functioning using items adapted from the Social Skills Rating System (Gresham & Elliott, 1990) using a 4-point Likert scale (*never* to *very often*). The ECLS-K: 2011 created an Externalizing Problem Behaviors subscale that assessed how often the

[1] The National Center for Education Statistics requires that all Ns be rounded to the nearest 50.

Table 1
Weighted Descriptive Statistics

Variables	*M*	*SD*
Child functioning		
Achievement	103.55	12.67
Executive function	−0.02	0.82
Externalizing problems	1.70	0.62
Parenting behaviors		
Use of corporal punishment	16.9%	
Parental warmth	3.51	0.50
Cognitive stimulation	−0.01	1.15
Neighborhood characteristics		
Violent crime	2.64	1.22
Air pollution	38.83	4.42
Advantage	−0.034	1.93
Disadvantage	−0.01	1.88
Cultural resources	3.99	0.53
Service availability	1.82	0.88
Child characteristics		
Executive function at baseline	0.00	2.43
Language at baseline	18.49	3.78
Sex (male)	51.6%	
White	52.2%	
Black	13.3%	
Asian	3.8%	
Latino	25.0%	
Other race	5.7%	
Low birth weight	9.6%	
Age (in months)	109.10	1.69
Household characteristics		
Aggregated income	46,630	9.39
Married	60.1%	
Family is immigrant	25.7%	
Number of children in household	2.59	1.25
Urbanicity (rural)	30.1%	
Parent education		
Less than high school	8.9%	
High school degree	20.1%	
Some college	32.3%	
Bachelor	22.1%	
Advanced	16.6%	
Region of residency		
North	16.0%	
Midwest	21.9%	
South	37.7%	
West	24.4%	

Note. U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Kindergarten Class of 2010–11 (ECLS-K: 2011).

child engaged in externalizing behaviors like arguing and fighting (six items; $\alpha = .87$).

Income. At each wave of data collection, primary caregivers reported total household income earned in the prior year. Income was recorded categorically into 18 income bins from less than $5,000 to greater than $200,000. To create a continuous income measure, cases were assigned to the midpoint of the selected income category (or $200,001 for cases falling into that category). A cumulative measure of income averaged over kindergarten through third grade was used based on prior research that a child's development at any given point in time is more strongly related to a family's cumulative income than to current income (Blau, 1999; Votruba-Drzal, 2006). Additionally, numerous studies have shown nonlinear relations between childhood income and outcomes, with the largest effects observed for the lowest income children and the size of associations shrinking as income increases (e.g., Duncan, Ziol-Guest, & Kalil, 2010; Duncan, Yeung, Brooks-Gunn, & Smith, 1998; Votruba-Drzal, 2006). The most common approaches to modeling this nonlinearity have been to use a log function, which fits a steeper slope at lower income levels (Duncan et al., 1998; Mayer, 1997; Votruba-Drzal, 2006); thus, we logged the cumulative income measure.

Community characteristics. Six measures of community resources and stressors were derived from national administrative data sources available at the zip code or census tract level. Using Geographic Information Systems (GIS) software, we aggregated community measures to an appropriate geographic area determined based on prior research and validation checks. The testing of community characteristics at different radii was done because community resources and stressors may impact families beyond the specific zip code or census tract in which they live. For instance, families often access health care that is in a census tract and zip code outside of their own (e.g., Wing & Reynolds, 1988). We created community measures at several different radii based on prior research (e.g., Miller, Votruba-Drzal, Coley, & Koury, 2014). At every wave these measures were then merged with the ECLS-K: 2011 data via children's census tracts or zip codes of residence, aggregated across Waves 1 thorough 7, and correlated with selected child or family measures to assess predictive validity. The radii tested ranged from the smallest geographic area measured, which was the census tract or zip code alone, to a 25 mile radius from the zip or tract centroid.

Community resources. We created a measure of *cultural resources* at the zip code level using data drawn from the 2010 U.S. Economic Census and Esri. The Economic Census provided data on counts of important enriching resources like museums, libraries, zoos, botanical gardens, and performing arts attractions, and Esri provided data on the number of public parks (Esri, TomTom North America). Counts of these resources in children's zip codes were summed and logged to correct for nonnormality. A measure of *service availability*, including social services (e.g., food banks, housing assistance), medical services (e.g., doctors' offices, hospitals), and educational services (e.g., tutoring services, schools), was created using 2012 Economic Census data. Services were summed within a 2.5-mile radius and, because such services typically have limited capacity and the raw number was highly intercorrelated with the cultural resource measure, this count was divided by the number of residents within 2.5 miles of the zip code. Lastly, a measure of *socioeconomic advantage* was created with American Community Survey data (ACS, 2010–2014 5-year estimates) by standardizing and averaging the percentage of residents with college degrees, professional/managerial jobs, and high ($>$ $100,000) incomes, as well as the median income within children's census tracts ($\alpha = .95$; Dupéré et al., 2010). Resource indicators were created at each wave of data collection using children's residence and then averaged across all years.

Community stressors. *Violent crime* was assessed using the Federal Bureau of Investigation's Uniform Crime Reporting Database which provides monthly reports of known criminal offenses and arrests by precinct zip code. Monthly counts of murder, manslaughter, assault, rape, and robbery were summed within each year, aggregated to the zip code level, and averaged across a 2-mile radius from each child's zip code. *Air pollution* was as-

sessed using data from the Environmental Protection Agency's, 2011 National Air Toxics Assessment (NATA). NATA provides a snapshot of outdoor air quality with respect to emissions of toxic pollutants that pose a threat to human health, calculated at the census tract level. *Neighborhood disadvantage* was assessed with a composite of ACS data (2010–2014 5-year estimates) delineating percentage of individuals in poverty, receiving public assistance, unemployed, without a high school degree, and in female-headed households within children's census tracts ($\alpha = .92$; Brody et al., 2001; Sampson, Raudenbush, & Earls, 1997). These indicators were standardized and averaged within wave to create a measure of neighborhood socioeconomic disadvantage. Community stressors were created at each wave of data collection and then averaged across all years.

Family resources and stressors. Several parenting measures were drawn from the ECLS-K: 2011. *Cognitive stimulation* in the home environment, reported by parents at Waves 1, 2, 4, and 6, captured activities such as reading books, participating in lessons or programs, and taking trips to the zoo or museum. At each wave items were standardized and averaged, and then a cumulative cognitive stimulation measure was created by averaging across waves (10–24 items; $\alpha = .56–.80$). *Parental warmth* was assessed at Waves 2 and 7 via parent report 4-point scale (*not true*, *somewhat true*, *mostly true*, *completely true*). Items included questions regarding whether the parent [and child] "have warm, close times together," "shows child love even when in bad mood," and expresses affection by "hugging, kissing, and holding" (4–8 items; $\alpha = .56–.69$). The ECLS-K: 2011 had one question tapping parental use of corporal punishment, at Wave 2. Because of skew, this variable was dichotomized to indicate whether the parent spanked the child in the past week.

Child and family demographic characteristics. Numerous child and family demographic factors were included as covariates. Child characteristics included age in months at assessment, child gender, race/ethnicity (White, African American, Hispanic, Asian, Native American, or multiracial) and low birth weight status (less than 5.5 lbs.). We also controlled for measures of children's language skills (PreLAS; Duncan & DeAvila, 1998; 20 items, $\alpha = .91$) and executive functioning skills (average of Dimensional Change Card Sort [Zelazo, 2006] and Numbers Reversed subtest of the Woodcock-Johnson III Tests of Cognitive Abilities [Mather, 2001]) assessed at kindergarten entry. These measures were included to control for unmeasured, time-invariant differences in children and families that are associated with children's achievement and behavior (NICHD ECCRN and Duncan, 2003); thus, helping to reduce concerns of omitted variable bias.

Family characteristics that are correlated with family income, community characteristics, and child development also served as covariates, including highest level of parental education (less than a high school degree, high school degree/GED, some college or vocational school, or a bachelor's degree or greater), stable marital status, stable maternal employment, whether either parent was an immigrant, and the number of children under the age of 18 in the household (averaged across Waves 1–7). We also controlled for region of the country in which the family resided (North, South, Midwest, or West) and whether they lived in a rural area.

Data Analysis

Structural equation models (SEM) were estimated in M*plus* Version 8 software (Múthen & Múthen, 2008) using maximum likelihood estimation. As shown in our conceptual model (see Figure 1), SEM assessed whether links between family income and children's functioning were mediated by community and family resource and stress processes. Separate models were estimated for each child outcome: achievement, executive functioning, and externalizing problems. Covariances between community characteristics and between parenting measures were freely estimated. To account for nesting of children within schools and communities, cluster adjustments were made at the census tract-level for all analyses (Preacher, Zyphur, & Zhang, 2010). To help control for selection into income levels and neighborhoods, and for individual differences in family functioning and children's development, covariates were included as predictors for all endogenous variables in the models (community characteristics, parenting, and child outcomes).

Overall fit of each model was assessed using the root mean square error of approximation (RMSEA), a measure of relative fit better suited for larger sample sizes, the comparative fit index (CFI), and the Tucker-Lewis Index (TLI). RMSEA values below .05 and CFI and TLI values above .95 support good model fit (Cangur & Ercan, 2015). To improve model fit, we trimmed nonsignificant paths in all cases where it resulted in better fit. Once the most parsimonious model was established, estimates of indirect effects were calculated using the "model indirect" command in M*plus* to test whether community and family processes mediated links between income and child outcomes (Preacher et al., 2010).

A sampling weight (W1P0) was applied in all analyses to allow results to be generalized to a nationally representative kindergarten cohort. Missing data were imputed using multiple imputation in M*plus* 8 (Asparouhov & Muthen, 2010) to create 50 imputed data sets. Parameter estimates were averaged over the 50 fitted models, and standard errors were computed using the average of the standard errors over the set of analyses and the between imputation variation of parameter estimates (Rubin, 1987).

Sensitivity analyses were conducted on all models to address concerns about our decision to include children with disabilities who participated in direct assessments in our sample. More specifically, all models were run excluding children with disabilities to test whether the patterns of results were consistent. Results held across all models, thus the models that we present herein are based on the full sample of children, including those with disabilities. An additional set of sensitivity analyses were performed to consider whether links between income, parenting, and children's development differ by race/ethnicity, given some prior literature suggesting that the effects of parenting behaviors may differ by race/ethnicity (Dornbusch, Ritter, Leiderman, Roberts, & Fraleigh, 1987; Lansford et al., 2005; Steinberg, Mounts, Lamborn, & Dornbusch, 1991). The results of these analyses uncovered no systematic findings (results are available by request).

Results

Table 2 presents the standardized coefficients of paths in each of the three final path models. After eliminating nonsignificant paths, the models had an excellent fit: $\chi^2(32) = 29.64$, RMSEA = 0.001, CFI = 1.00, TLI = 1.00 for achievement; $\chi^2(41) = 40.84$,

Table 2
Correlation Matrix

Measures	Cognitive	Executive function	Externalizing	Income	Emotional support	Corporal punishment	Cognitive stimulation	Crime	Pollution	Advantage	Disadvantage	Cultural resources/ parks
Executive function	0.59											
Externalizing	−0.19	−0.16										
Income	0.41	0.24	−0.15									
Emotional support	0.06	0.03	−0.08	0.09								
Corporal punishment	−0.13	−0.09	0.12	−0.13	−0.15							
Cognitive stimulation	0.27	0.15	−0.07	0.33	0.17	−0.10						
Crime	−0.09	−0.04	0.05	−0.13	−0.01	0.04	−0.04					
Pollution	−0.15	−0.09	0.04	−0.23	0.00	0.12	−0.11	0.24				
Advantage	0.33	0.18	−0.10	0.54	0.05	−0.15	0.31	−0.12	−0.19			
Disadvantage	−0.35	−0.19	0.11	−0.52	−0.05	0.14	−0.27	0.27	0.36	−0.76		
Cultural resources	0.01	0.01	−0.04	0.06	−0.01	−0.08	0.04	0.19	0.33	0.25	0.04	
General resources	0.07	0.05	0.02	−0.03	0.01	−0.06	0.10	−0.11	−0.26	0.12	−0.14	−0.20

Note. U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Kindergarten Class of 2010–11 (ECLS-K: 2011).

RMSEA = 0.001, CFI = 1.00, TLI = 1.00 for executive function; and $\chi^2(34) = 47.53$, RMSEA = 0.004, CFI = 0.999, TLI = 0.996 for externalizing behavior problems. Starting with the leftmost side of the conceptual model (see Figure 1)—income's relation to neighborhood characteristics (first panel of variables in Table 2)—we see that family income was directly related to nearly all measured neighborhood processes. Income was significantly associated with increased neighborhood resources and fewer neighborhood stressors, with the exception of service availability. Associations between income and neighborhood advantage and disadvantage were the largest (.30 *SD* and −.27 *SD* change per standard deviation increase in log income, respectively). Associations with air pollution, violent crime, and cultural resources were smaller (−.11 *SD*, −.08 *SD*, .07 *SD*, respectively).

Next, moving to the middle of our conceptual model examining how neighborhood characteristics predicted parenting, results showed several significant direct links (second panel of Table 2). Parental warmth was negatively predicted by neighborhood disadvantage (−.03 *SD*). Cognitive stimulation was positively predicted by advantage (.07 *SD*), service availability (.04 *SD*), and cultural resources (.03 *SD*). Lastly, the use of corporal punishment was positively predicted by air pollution (.07 *SD*) and negatively predicted by advantage (−.06 *SD*) and cultural resources (−.06 *SD*). Beyond these links between neighborhood and family processes, family income retained significant direct links with family processes, predicting greater parental warmth (.09 *SD*), greater cognitive stimulation (.04), and less corporal punishment usage (−.06 *SD*).

Lastly, parenting and neighborhood resources and stressors were associated with child outcomes (last panel of Table 2). Corporal punishment predicted all three child outcomes: it had negative links to achievement and executive functioning (−.05 *SD*, −.06 *SD*), and positive links to externalizing problems (.07 *SD*). Cognitive stimulation predicted better achievement (.05 *SD*) and executive functioning skills (.06). Warm parenting was related to lower externalizing problems (−.06 *SD*). Neighborhood characteristics showed more sporadic direct links with child outcomes. Specifically, disadvantage was linked to lower achievement scores (−.04 *SD*), while cultural resources predicted higher achievement (.03 *SD*). Violent crime and resource availability were linked to increased externalizing (.05 *SD*, .03 *SD*). Beyond these processes, family income also retained direct links to all three measures of child functioning (.09 *SD* for achievement; .08 *SD* for executive functioning; −.06 *SD* for externalizing problems).

Mediation of Income's Associations With Child Outcomes via Neighborhood and Parenting Factors

Our models also tested whether neighborhood characteristics mediated links between income and child outcomes both directly and indirectly through dimensions of parenting. Table 3 presents the standardized coefficients for all direct paths estimated in the final path models, while Figures 2, 3, and 4 present the standardized coefficients for significant indirect effects of income operating through neighborhood and parenting factors on achievement, executive functioning, and externalizing, respectively.

Achievement. Paths presented in Figure 2 show that multiple neighborhood factors mediated income's association with achievement, both directly and through parenting. Income was positively

Table 3
Direct Paths Estimated in Final Path Models

Outcomes and predictors	Cognitive skills β (*SE*)	Executive function β (*SE*)	Externalizing problems β (*SE*)
Violent crime			
Income	−0.08 (0.02)***	−0.08 (0.02)***	−0.08 (0.02)***
Air pollution			
Income	−0.11 (0.02)***	−0.11 (0.02)***	−0.11 (0.02)***
Advantage			
Income	0.30 (0.01)***	0.30 (0.01)***	0.30 (0.01)***
Disadvantage			
Income	−0.27 (0.01)***	−0.27 (0.01)***	−0.27 (0.01)***
Cultural resources			
Income	0.07 (0.01)***	0.07 (0.01)***	0.07 (0.01)***
Service availability			
Income	−0.03 (0.02)	−0.03 (0.02)	−0.03 (0.02)
Parental warmth			
Income	0.09 (0.02)***	0.09 (0.02)***	0.09 (0.02)***
Violent crime	0.02 (0.01)	0.02 (0.01)	0.02 (0.01)
Air pollution	0.01 (0.02)	0.01 (0.02)	0.01 (0.02)
Disadvantage	−0.03 (0.02)*	−0.03 (0.02)*	−0.03 (0.02)*
Cultural resources	0.02 (0.02)	0.02 (0.02)	0.02 (0.02)
Service availability	0.02 (0.01)	0.02 (0.01)	0.02 (0.01)
Cognitive stimulation			
Income	0.04 (0.02)*	0.04 (0.02)*	0.04 (0.02)*
Violent crime	0.02 (0.01)	0.02 (0.01)	0.02 (0.01)
Air pollution	—	—	—
Advantage	0.07 (0.01)***	0.07 (0.01)***	0.07 (0.01)***
Disadvantage	—	—	—
Cultural resources	0.03 (0.01)**	0.03 (0.01)**	0.03 (0.01)**
Service availability	0.04 (0.01)***	0.04 (0.01)***	0.04 (0.01)***
Corporal punishment			
Income	−0.06 (0.02)**	−0.06 (0.02)**	−0.06 (0.02)**
Violent crime	—	—	—
Air pollution	0.07 (0.01)***	0.07 (0.01)***	0.07 (0.01)***
Advantage	−0.06 (0.02)***	−0.06 (0.02)***	−0.06 (0.02)***
Disadvantage	—	—	—
Cultural resources	−0.06 (0.02)**	−0.06 (0.02)**	−0.06 (0.02)**
Service availability	−0.02 (0.01)	−0.02 (0.01)	−0.02 (0.01)
Child functioning			
Income	0.09 (0.02)***	0.09 (0.02)***	−0.06 (0.02)**
Parental warmth	—	—	−0.07 (0.01)***
Corporal punishment	−0.04 (0.01)***	−0.03 (0.01)*	0.06 (0.01)***
Cognitive stimulation	0.05 (0.01)***	0.03 (0.01)*	0.01 (0.01)
Violent crime	−0.01 (0.01)	—	0.05 (0.01)***
Air pollution	—	—	—
Advantage	—	—	—
Disadvantage	−0.04 (0.01)**	—	0.01 (0.02)
Cultural resources	0.03 (0.01)*	—	0.02 (0.01)
Service availability	0.01 (0.01)	—	0.04 (0.01)**

Note. $N \approx 17{,}600$. Models control for language and executive function at baseline, sex, age, race/ethnicity, low birth weight, parent education, marital status, immigrant status, region, and number of children at home. U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Kindergarten Class of 2010–11 (ECLS-K: 2011).
* $p < .05$. ** $p < .01$. *** $p < .001$.

associated with achievement through its link with lower rates of neighborhood disadvantage and increased cultural resources, both of which had direct relations with achievement. In addition, higher family income predicted increased neighborhood advantage, decreased air pollution, and increased cultural resources, all of which were linked to less corporal punishment usage and, in turn, better academic skills. Indirect paths from income to academic skills through increased advantage and cultural resources also ran through higher levels of cognitive stimulation. The link between income and cognitive skills was also mediated by parenting that did not operate through neighborhood characteristics. In particular, there were positive indirect effects of income operating through the use of corporal punishment and cognitive stimulation. Neighborhood factors, directly and via parenting, accounted for about 12% of income's association with achievement.

Executive functioning. Figure 3 presents the significant indirect pathways between family income and children's executive functioning that operated through community and/or family char-

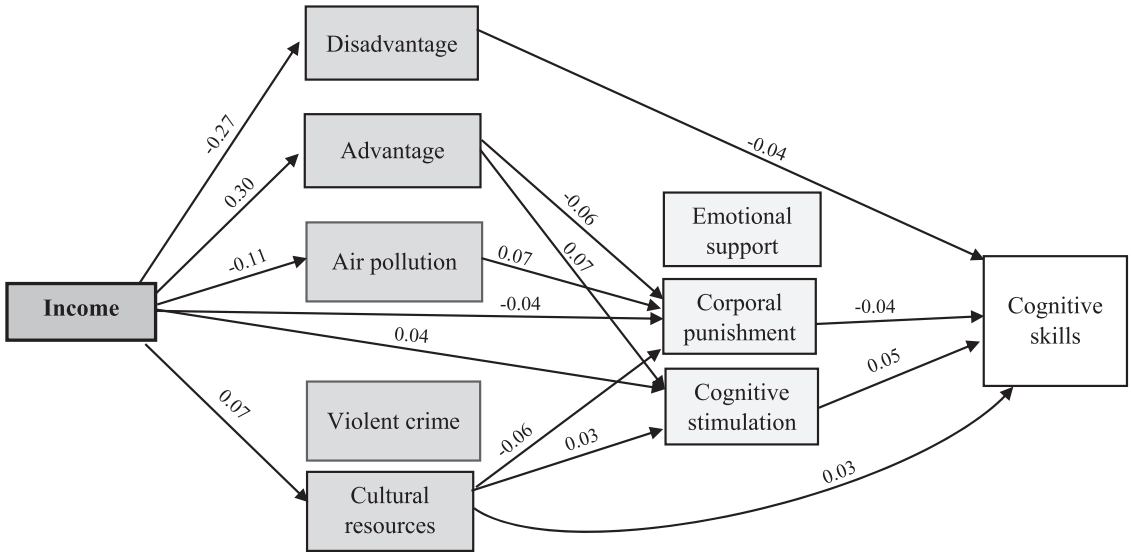

Figure 2. Significant indirect paths from income's links to cognitive skills through parenting and neighborhood characteristics. $N \approx 17{,}600$. Arrows illustrate significant indirect effects of income ($p < .05$). Standardized path coefficients presented within figure. U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Kindergarten Class of 2010–11 (ECLS-K: 2011).

acteristics. We identified positive and significant indirect effects from family income to executive function through decreased air pollution, increased advantage, and more cultural resources, which in turn were associated with better executive function via reduced use of corporal punishment. The link between income and executive functioning was also mediated by increased advantage and cultural resources through their positive relation with cognitive stimulation, which predicted better executive functioning. In the case of executive functioning, neighborhood factors, directly and via parenting, explained roughly 2% of income's links to executive functioning.

Externalizing behavior problems. Figure 4 displays significant indirect effects for externalizing behavior problems operating through neighborhood and parenting factors. Income was associated with parenting directly, with higher income linked to less externalizing problems through links with more emotionally supportive parenting and less corporal punishment usage. Turning to mediations through neighborhood factors, violent crime mediated

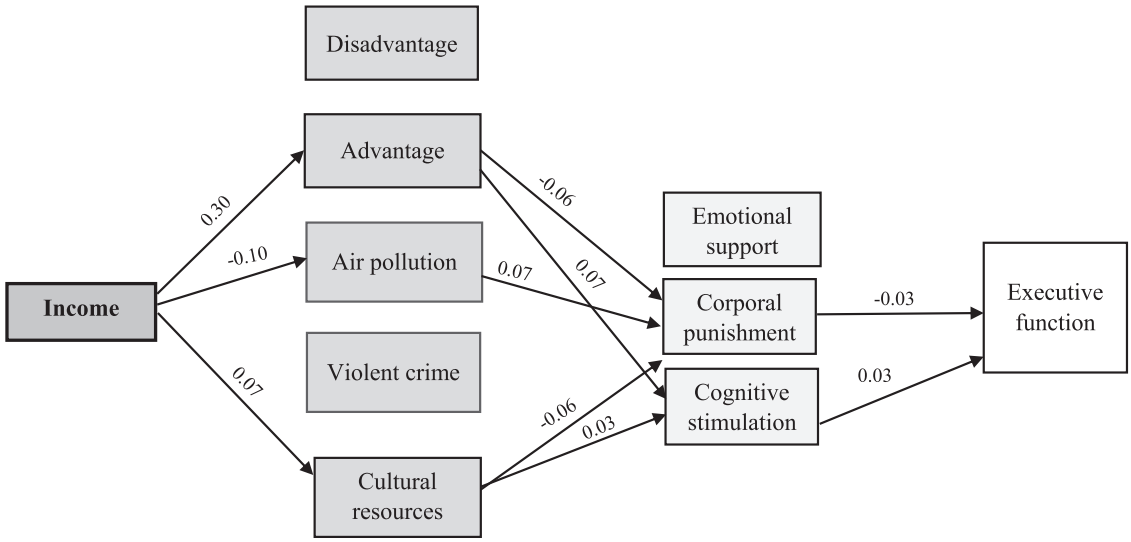

Figure 3. Significant indirect paths from income's links to executive function through parenting and neighborhood characteristics. $N \approx 17{,}600$. Arrows illustrate significant indirect effects of income ($p < .05$). Standardized path coefficients presented within figure. U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Kindergarten Class of 2010–11 (ECLS-K: 2011).

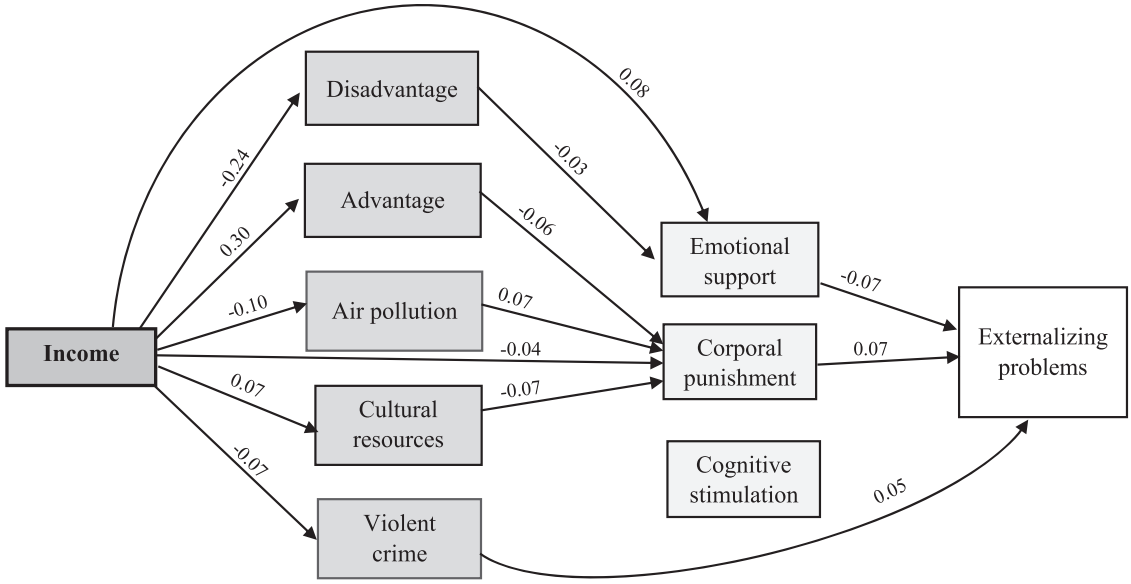

Figure 4. Significant indirect paths from income's links to externalizing problems through parenting and neighborhood characteristics. $N \approx 17{,}600$. Arrows illustrate significant indirect effects of income ($p < .05$). Standardized path coefficients presented within figure. U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Kindergarten Class of 2010–11 (ECLS-K: 2011).

the association of income and externalizing problems directly; higher income was linked to less neighborhood crime, which in turn predicted lower levels of externalizing. Neighborhood disadvantage mediated the income-externalizing association through its negative relation with warm parenting. Finally, income predicted higher neighborhood advantage, lower air pollution, and higher cultural resources, all of which predicted less use of corporal punishment and, in turn, fewer externalizing behavioral problems. Neighborhood factors explained 25% of income's association with externalizing problems.

Discussion

As income inequality and socioeconomic residential segregation have intensified over the past several decades (Bischoff & Reardon, 2013; Stone et al., 2015), so too has the need to understand differences in neighborhood contexts related to income and how these factors predict children's development. This is especially important given that both family income and neighborhood characteristics have been linked to academic and behavioral functioning (e.g., Bassok et al., 2016; Bradley et al., 2001; Kalil & Mayer, 2016; Leventhal et al., 2015; McCartney et al., 2007; Sampson et al., 2008), but prior literature has not fully explored how neighborhood characteristics act as a pathway through which income affects family and child functioning. Using a nationally representative sample of nearly 20,000 children starting kindergarten in 2010 linked with a broad array of administrative data on both resources and stressors within communities, this study helps to strengthen knowledge of how income relates to several different neighborhood characteristics and how they, in turn, relate to achievement, executive functioning, and externalizing behavior problems both directly and through parenting. Results highlight several different processes by which family income is associated with child outcomes via neighborhood and family factors. These identified processes have important implications for efforts to improve economically disadvantaged children's surroundings and skills.

Differences in Community Context by Income

Notably, income was consistently related to the neighborhood characteristics studied here (with the exception of service availability). Higher income predicted increased resources and fewer stressors, with effect sizes ranging from small (.07 *SD*) for violent crime and cultural resources/parks to almost 1/3 of a *SD* for measures of neighborhood advantage and disadvantage. While prior research has documented links between income and some of these factors, like concentrated disadvantage and crime (Hajat et al., 2013; Reardon & Bischoff, 2011; Stucky, Payton, & Ottensmann, 2016), literature empirically documenting income gaps in other important neighborhood resources, like cultural resources and parks, is lacking. To our knowledge, this is the first study to show economic disparities in access to such a wide range of cultural resources. Moreover, this study advances the literature by documenting income gaps in other factors, like violent crime and air pollution, using national data and validated geographic measures to expand prior research typically conducted on smaller, regional samples (e.g., Finkelstein et al., 2003; Stucky et al., 2016).

Mediation of Income-Child Outcome Associations via Neighborhood Processes

Next, we uncovered several patterns related to how neighborhood processes help to explain income disparities in child outcomes. We observed relations between characteristics of neigh-

borhoods and child outcomes that were both direct and running through parenting. With the exception of service availability, which did not differ by family income, all of the neighborhood factors examined in this study served as mediators linking income to children's outcomes either directly or, more commonly, through parenting processes. When comparing these results to those from a study using similar measures and analyses but a younger sample (aged 0–5; Coley, 2019), it is interesting that neighborhood factors had more direct links to child outcomes among children in third grade than among children entering kindergarten. In this study, both neighborhood disadvantage and cultural resources had direct associations with cognitive skills, while violent crime was related to externalizing problems. In contrast, there was a single direct link between community context and cognitive skills in the Coley study, perhaps suggesting that as children progress through elementary school they have more direct and less supervised interactions with neighborhood contexts (Booth & Crouter, 2001; Leventhal, Dupéré, & Brooks-Gunn, 2009). Still, it is important to reiterate that the majority of links between neighborhood processes—including neighborhood disadvantage, cultural resources, and violent crime—and child outcomes operated through parenting, suggesting that parents continue to play an essential role in scaffolding or transmitting the resources and stresses of broader neighborhood contexts to elementary school-age children.

Neighborhood advantage and disadvantage, which are rarely differentiated in neighborhood research (e.g., Drukker, Feron, Mengelers, & Van Os, 2009; Dupéré, Leventhal, Crosnoe, & Dion, 2010; Kohen, Leventhal, Dahinten, & McIntosh, 2008), were uniquely related to parenting and child outcomes. Neighborhood advantage had more links to parenting than did disadvantage, a novel finding in the neighborhood literature that has mostly focused on associations between disadvantage, parenting, and child development (e.g., Kohen et al., 2008; Maguire-Jack & Font, 2017). Results showing a link between advantage and cognitive stimulation in the home replicates results of prior studies that examined advantage in isolation (e.g., Dupéré et al., 2010). However, the finding linking advantage to spanking has not been documented elsewhere. Underlying this finding could potentially be differences in collective norms regarding the appropriateness of corporal punishment use related to neighborhood advantage. Research has established that when parents feel neighbors approve of corporal punishment, they are more likely to utilize it (Fleckman, Taylor, Theall, & Andrinopoulos, 2019). Because spanking is less likely to be used by socioeconomically advantaged parents (Smith & Brooks-Gunn, 1997; Straus & Stewart, 1999), it is possible that as neighborhood advantage increases, so do community norms critical of spanking. Accordingly, this study underscores the importance of examining these processes separately when feasible.

Also of note, results show that the number of cultural resources in a neighborhood, like libraries, museums, and parks, was linked to higher levels of cognitive stimulation in the home as well as to cognitive skills directly. This adds to a growing literature highlighting benefits of such resources for both parents and children (Coley, 2019; Miller et al., 2019). These studies, taken together, provide mounting evidence to support programs and policies that seek to improve access to such amenities, particularly for low-income families. For instance, library outreach programs like book mobiles have been successfully utilized to provide services to underserved populations (e.g., Boyce & Boyce, 1995). Similarly, programs increasing disadvantaged children's exposure to parks and green space are gaining popularity (e.g., 21st Century Conservation Corp, Kids in the Woods), though their implications for development have not been studied (Jennings & Gaither, 2015). Expanding these programs, as well as using this model to deliver other cultural resources to low-income families, like mobile museums or science centers, may have positive impacts on children's development, and future research on the causal implications of these programs is warranted.

Implications for Research on Children, Families, and Communities

An important conclusion of this research is that the multiple microsystems that children and families inhabit simultaneously shape development. As articulated in Bronfenbrenner's bioecological theory (Bronfenbrenner & Morris, 2006), these results illustrate how children's most immediate surroundings—their interactions with parents—might be influenced by broader contexts like family economic circumstances and neighborhoods. In addition to observing links between income, neighborhood factors, and child outcomes directly, both income and all of the community resources and stressors explored in this study were linked to at least one aspect of parenting. These results provide empirical evidence in support of the bioecological model and is one of the very few studies that directly tests how the distal community context operates through the more proximal family microsystem.

Second, the community context measures used in this study were intercorrelated. This further highlights the importance of accounting for various aspects of children's communities and the biases that are likely to underlie studies assessing the effect of one characteristic in isolation. For instance, several studies examining neighborhood socioeconomic disadvantage or advantage do not consider these factors in conjunction (e.g., Sastry & Pebley, 2010; Xue, Leventhal, Brooks-Gunn, & Earls, 2005). Given that these aspects of neighborhoods are correlated with other community characteristics such as pollution, violence, and cultural resources, it is hard to know whether prior studies were identifying true associations between neighborhood socioeconomic status and outcomes, or whether results are biased because of the failure to consider other key neighborhood characteristics. In this respect, this study improves on past literature by examining several aspects of communities simultaneously.

Third, this study suggests that neighborhood resources and stressors often predict corresponding processes at the family-level, but also cross over with neighborhood resources relating to markers of stressful parenting and neighborhood stressors associated with measures of parental investments. For example, neighborhood advantage and cultural resources, key domains of neighborhood resources, related to use of corporal punishment, a marker of stressed parenting, as well as parent investments in the form of cognitive stimulation. Additionally, neighborhood disadvantage, a measure of neighborhood stress, exhibited significant links with warm parenting, another indicator of parent investments. Most neighborhood resources and stressors that emerged as significant pathways linking income to children's development related to multiple domains of children's development, not just a single domain. Particularly salient were neighborhood cultural resources, advantage, and air pollution, which served as pathways for in-

come's associations with all three domains of children's development under consideration in this study. The one exception was that neighborhood violent crime was only a significant mediator linking income to externalizing problems; violent crime did not serve as a mediator linking family income to academic achievement or executive functioning. This finding is consistent with extant literature documenting links between neighborhood violent crime and problem behaviors. Indirect associations between income operating through violent crime were not further mediated by dimensions of parenting, which may reflect children's increasingly direct interaction with the neighborhood contexts as they age. During middle childhood, Ingoldsby and Shaw (2002) have argued, children have greater direct exposure to their neighborhood context. For children living in neighborhoods characterized by violent crime this may involve more direct exposure to violent crime (i.e., victimization, witness to crime) as well as more opportunities to interact with deviant peers, all of which may contribute to the development of externalizing problems.

Role of Administrative Data in Studies of Children and Families

Recently, researchers have begun to embrace the promise of using administrative data to advance basic science and inform public policy (Penner & Dodge, 2019). Historically, studies of neighborhood effects on children and families have used data on neighborhoods reported by the families themselves, and those studies that utilize independent administrative data have primarily relied on data from the Decennial Census (e.g., Chung & Steinberg, 2006; Sastry & Pebley, 2010). The current research provides a unique example of how administrative data from a variety of sources can be combined with nationally representative data on children and families to gain a fuller understanding of how multiple aspects of communities simultaneously relate to parenting practices and children's development.

This is not to overlook the importance of research that has richly studied targeted aspects of communities at local levels. For instance, using data from the Chicago School Readiness Project and the Chicago Police Department, Sharkey and colleagues (2012) geocoded all homicides in the city of Chicago to pinpoint the exact date and location and determine whether homicides occurring close to children's homes impacted their cognitive functioning. The Sharkey study provides an excellent examination of how detailed, precise geospatial data can help answer causal questions regarding how neighborhood contexts affect children's development. For publicly available administrative data to reach its full potential, we need data of this richness to be collected at a national level to expand the breadth of our research on neighborhood contexts. Research that leverages administrative data, such as the present study (also see Coley, 2019; Goerge & Wiegand, 2019; Miller, Votruba-Drzal, & Coley et al., 2019), may propel increasing efforts to integrate detailed administrative data and make them widely available to researchers and policymakers. Such research is not useful solely for psychological and educational researchers, but also for housing and urban development officials and community planners. For instance, this work suggests that placing parks and green spaces, as well as other cultural resources like libraries or book mobiles, in neighborhoods with large proportions of economically disadvantaged families may help promote low-income children's development. Results also suggest that community planning and policing should focus on decreasing crime in the neighborhoods in which children live. Programs like Chicago's Safe Passage Program, which uses community members to watch streets and routes children use to travel to and from school, has been linked to decreased crime (Chicago Public Schools, 2018).

Limitations

There are limitations to this study that must be acknowledged. First, these results are correlational and, hence, must be interpreted with caution. Accordingly, while the correlational design of this study provides a rich description of the community and family processes that differ by income, it is possible that the observed associations between income, community characteristics, parenting, and child outcomes were caused by some unmeasured features of the parents or children in our sample. Notably, attempts were made to limit endogeneity bias by controlling for children's kindergarten language and executive functioning skills, as well as characteristics of parents and families that relate to both family income and child outcomes. Nonetheless, future work in this area should make efforts to leverage experimental and quasi-experimental designs to better address selection effects.

We must also note that the effect sizes obtained from our results were consistently small. Although moderate to large differences emerged in community resources and stressors across family income, links with family processes and child achievement were small. We argue that results still have practical importance. First, estimates may be conservative because we controlled for language skills and executive functioning in kindergarten when predicting third grade skills. To the extent that the associations between income and neighborhood with achievement and behavior stem from connections with cognitive and behavioral skills that children acquire prior school entry, our estimates will be downwardly biased. Second, estimates may be deflated because of high levels of measurement error, particularly in community characteristics. For instance, the air pollution variable was modeled as opposed to observed directly, which could lead to error. Similarly, the FBI's Uniform Crime Reporting is a voluntary program, and many jurisdictions do not make these reports. This led to a large amount of missing data on crime, which were imputed. In addition, these data are reported at the precinct level, and do not pinpoint the precise location of the crimes that were committed. Together, these factors may help explain why the proportion of total variance attributed to neighborhood factors was modest, ranging from 2% for executive functioning to 25% for externalizing problems. Lastly, the administrative data varied in terms of the geographic level available, and while census tract data are preferable because tracts are smaller than zip codes, several indicators were only available at the zip code level. Thus, our community measures created using zip code data—cultural resources, service availability, and crime—were less precise than the other measures available at the tract level. Given these notable measurement limitations, it is somewhat remarkable that the majority of our community measures showed reliable associations with child and family functioning, and their use marks an advancement to prior literature on poverty and place. Given these results showing the usefulness of community measures in understanding children's development, we suggest that future efforts be made to expand both the categories of and the geographic scale at which information is collected and made

available to the public. Indeed, the Census Bureau releases a limited number of community measures at the Census Block level, which roughly corresponds to a neighborhood block. Having information about neighborhoods at this ecologically meaningful scale would provide a more accurate picture of families' neighborhood contexts and increase variability in these measures, allowing them to explain more variance in child and family functioning.

In addition, while we examined two important contexts for child development—community and family contexts—there are other important contexts that relate to children's academic and behavioral skills. For example, children's school contexts also contain resources and stressors that may influence development. Such important school resources include per pupil expenditures, qualified teachers, and rigorous curricula. School stressors include things like school danger/violence and inadequate facilities and staff. Administrative data sets like the Common Core of Data made available by the Department of Education could be linked to data sets like the ECLS-K to examine how aspects of another important microsystem relate to the development of economic disparities in children's skills.

Conclusion

Despite limitations, this study provides support for and expands leading theoretical frameworks used to explain the role of income on children's development by revealing how income is related to several neighborhood characteristics and how, in turn, these characteristics are associated with parenting and child outcomes. Moreover, it provides an example of how bioecological theory can be put into practice (Bronfenbrenner & Morris, 2006). Findings suggest that access to enriching resources and limited exposure to stressors may serve as key processes in mitigating income disparities in children's academic and behavior skills. Given that income gaps in children's skills are a major factor in the intergenerational transmission of disadvantage (Dekker et al., 2007; Duncan et al., 2008, 2014; Jäntti, 2009), programs and policies aimed at improving low-income children's access to community and family resources and mitigating levels of community and family stressors may be effective in supporting their long-term development.

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