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Rebekah Levine Coley, Tama Leventhal, Alicia Doyle Lynch, and Melissa Kull

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Relations Between Housing Characteristics and the Well-Being of Low-Income Children and Adolescents

Rebekah Levine Coley
Boston College

Tama Leventhal
Tufts University

Alicia Doyle Lynch and Melissa Kull
Boston College

Extant research has highlighted the importance of multiple characteristics of housing but has not comprehensively assessed a broad range of housing characteristics and their relative contributions to children's well-being. Using a representative, longitudinal sample of low-income children and adolescents from low-income urban neighborhoods ($N = 2,437$, ages 2–21 years) from the *Three-City Study*, this study assessed housing quality, stability, type (i.e., ownership status and subsidy status), and cost simultaneously to delineate their unique associations with children's development. Hierarchical linear models found that poor housing quality was most consistently associated with children's and adolescents' development, including worse emotional and behavioral functioning and lower cognitive skills. These associations operated in part through mothers' psychological functioning. Residential instability showed mixed links with functioning, whereas housing cost and type were not consistently predictive. Results suggest that housing contexts are associated with functioning across the developmental span from early childhood through late adolescence, with some differences in patterns by child age.

Keywords: housing, housing policy, residential stability, poverty, low-income families

Housing is a primary proximal context in which children's development unfolds. As such, the housing context has the potential to serve as a potent force influencing children's healthy growth and development. Factors such as stability, affordability, and physical characteristics may support or inhibit the central developmen-

tal tasks of children either directly or indirectly by affecting parental and family functioning. For low-income families, who face notable challenges in accessing safe, stable, and affordable housing, the housing context may be particularly influential (Newman, 2008). Indeed, prior research has delineated links between numerous individual characteristics of housing and children's health and well-being (Leventhal & Newman, 2010). Yet, individual housing characteristics do not occur in isolation; rather, factors such as housing quality, stability, type (owned, privately rented, or assisted housing), and cost are integrally interrelated (Coley, Kull, Leventhal, & Lynch, 2012; Edin, Deluca, & Owen, 2012; Hartig & Lawrence, 2003; Wood, Turnham, & Mills, 2008). Moreover, family resources, characteristics, and preferences affect the contexts in which families reside. As such, it is essential to consider multiple aspects of housing simultaneously to assess their unique roles, and to place housing within the broader contexts of families' lives.

No research to date has comprehensively assessed a broad range of housing characteristics and their relative contributions to children's well-being. This research takes such a comprehensive view by considering the quality, stability, type (i.e., ownership status and assistance status), and affordability of families' housing contexts, focusing on low-income families to highlight the unique constraints and opportunities faced by families with limited economic and social resources (Holupka & Newman, 2011). Using longitudinal data from a representative sample of over 2,400 children and adolescents in low-income families in low-income urban neighborhoods in three cities, we explored links between housing characteristics and children's cognitive, emotional, and behavioral functioning. We further assessed whether such links

Rebekah Levine Coley, Applied Developmental and Educational Psychology, Boston College; Tama Leventhal, Department of Child Development, Tufts University; Alicia Doyle Lynch and Melissa Kull, Applied Developmental and Educational Psychology, Boston College.

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Correspondence concerning this article should be addressed to Rebekah Levine Coley, Applied Developmental and Educational Psychology, Boston College, Campion Hall 239A, 140 Commonwealth Avenue, Chestnut Hill, MA 02467. E-mail: coleyre@bc.edu

were attenuated by central family processes related to stress and stability. Because our sample included children from early childhood (age 2) through late adolescence (age 21), we also investigated whether associations between housing contexts and child functioning were moderated by child age.

Conceptual Background

Our overarching conceptual model for exploring associations between housing contexts and children's development is framed within a bioecological perspective. Bioecological models of human development (Bronfenbrenner & Morris, 2006; Lerner, 2006) propose a multidirectional system in which individuals select and affect their primary contexts. Characteristics of and experiences within contexts, in combination with individual characteristics, in turn affect proximal processes, thereby influencing individuals' growth and development. In terms of housing selection, the bioecological model highlights how individual and family characteristics such as personal preferences, family needs and resources, as well as external opportunities and constraints may influence the housing contexts that families access (Saegert & Evans, 2003). Extant research supports this supposition, finding, for example, that cultural norms and personal preferences (Crowley, 2003), family size and structure (Schacter, 2001), and family human and financial capital (Conley, 2001) are associated with specific aspects of housing such as quality, stability, type, and cost. Similarly, external factors such as local housing policies and housing stock as well as processes of housing discrimination also are associated with families' access to and selection into housing (Flippen, 2001; Turner & Kingsley, 2008). Hence, research that seeks to assess associations among housing contexts and children's development must attend to these important selection factors.

As a primary proximal context in which children and families are embedded, bioecological theory asserts that characteristics of and experiences in housing will affect proximal processes and in turn children's growth and development. For example, poor quality housing may impose physiological stress on children, inhibiting their emotional stability and learning, whereas residential instability may interrupt peer and school networks, impeding academic and behavioral success. Housing characteristics may similarly affect parental well-being and parenting behaviors that subsequently influence children's development (Evans et al., 2010). Finally, bioecological theory highlights person–context interactions, here emphasizing how individual characteristics may intersect with housing contexts to jointly influence children's development. Children's developmental status is one individual factor that may alter the influence of housing contexts on children. For young children who spend limited time in school or outside of their parents' supervision, the home (along with childcare settings) typically represents their primary proximal developmental context. In early childhood, children experience rapid biological and physical growth and the development of fundamental emotional, behavioral, and cognitive skills (Shonkoff & Phillips, 2000). During this developmental period, young children may be more responsive to environmental stress or instability (Evans, 2004). In contrast, older children and adolescents spend more time in school, broader neighborhood contexts, and with peers (Brown & Larson, 2009; Steinberg & Morris, 2001), implying that housing contexts may be less influential overall.

Empirical Evidence on Housing and Low-Income Children's Development

A review by Leventhal and Newman (2010) delineated several aspects of housing contexts that are influential for low-income children's development and central to housing policy (see also Catalano & Kessel, 2003). These features include *physical quality*, measured by structural or maintenance deficiencies (e.g., lack of plumbing) and environmental hazards (e.g., lead paint); *residential instability*, captured by frequent residential moves; *housing type*, designating *homeownership* indicated by owning rather than renting a home and *subsidized housing*, marked by various forms of government assistance with rent; and *affordability*, or the cost of housing in relation to family income, with unaffordability typically defined as devoting more than 30% of family income to housing.

Prior research has assessed each of these aspects of housing and their links with children's development; however, it is important to note several major methodological limitations of past research that call into question both the validity and generalizability of findings (Evans, Wells, & Moch, 2003; Leventhal & Newman, 2010). Specifically, most of the research to date is based on nonexperimental studies, which are subject to problems of selection bias and unmeasured heterogeneity due to differential selection into housing related to unmeasured factors that also may be associated with child development. Many studies have not used a rich set of covariates to control for these background characteristics, and even fewer studies have used rigorous statistical techniques to account for selection. In addition, a number of studies are cross-sectional, which raises concerns about reliability. Finally, much of the research is based on small, nonrepresentative samples, limiting its generalizability.

For physical housing quality, a few studies indicate that children living in substandard housing demonstrate cognitive deficits (Evans, 2004; Krieger & Higgins, 2002). Related longitudinal research based on small, nonrepresentative samples (300 families with same-sex twins or 80 European Americans from Arkansas) has examined household chaos, which includes aspects of quality as well as crowding and disorganization, finding adverse associations with young children's cognitive as well as behavioral functioning (Deater-Deckard et al., 2009; Evans et al., 2010). Less research has assessed whether housing quality is similarly linked with poorer functioning among adolescents, who are less physiologically reactive to environmental insults but may nonetheless find focusing on school work or properly funneling emotions and behaviors difficult in housing with inadequate light and heat, or that is dangerous or uncomfortable.

Residential instability also has been linked to poor developmental outcomes. A large body of research on mobility, much of it based on nationally representative, longitudinal samples, indicates that moving has unfavorable short- and long-term associations with older children's and adolescents' schooling (e.g., Haveman, Wolfe, & Spaulding, 1991; Pribesh & Downey, 1999; Wood, Halfon, Scarlata, Newacheck, & Nessim, 1993). Other research on representative as well as urban samples also finds positive links with adolescents' problematic and risky behavior (Adam & Chase-Landsdale, 2002; Bernburg, Thorlindsson, & Sigfusdottir, 2009; Sharkey & Sampson, 2010); however, one study that used more stringent methods, by comparing within-person changes in mobility with within-person changes in adolescents' delinquency, failed

to replicate this pattern, raising concerns about possible selection bias (Gasper, DeLuca, & Estacion, 2010). Detrimental effects of residential instability are likely due to interruptions in school and peer contexts (Haynie, South, & Bose, 2006) and to the emotional and family instability (Astone & McLanahan, 1994) that often co-occur with residential moves, though they also may be related to selection bias. Limited research has focused specifically on residential mobility among families with young children, although one multisite study of unmarried parents found that young children who moved more exhibited greater externalizing and internalizing problems than their stable peers (Ziol-Guest & McKenna, in press).

In relation to housing type, most of the work on homeownership points to favorable short- and long-term associations between ownership (vs. renting) and a range of outcomes for children and adolescents. Specifically, studies using nationally representative, longitudinal data find that young and school-age children growing up in owned homes display superior math and reading skills and fewer behavior problems than children in families who rent (Boyle, 2002; Haurin, Parcel, & Haurin, 2002). Likewise, adolescent children of homeowners have higher educational attainment (Aaronson, 2000; Boehm & Schlottman, 1999) and engage in fewer problem behaviors (Green & White, 1997) than their peers whose families rent. However, those studies using advanced analytic techniques to address selection bias often fail to replicate the benefits of homeownership for children's development, indicating that unmeasured family and housing market characteristics may drive these associations (Barker & Miller, 2009; Holupka & Newman, 2010). It is also essential to attend to collinearity between ownership and other aspects of housing. Homeownership is often associated with higher costs but more stability than subsidized or privately rented housing, for example (Herbert & Belsky, 2006), suggesting the need to assess the relative importance of these aspects of housing concurrently.

For low-income families, it is also critical to consider the role of assisted housing, typically provided through either vouchers or the provision of public housing, which directly subsidizes the housing unit. Assisted housing has links with both housing cost and quality because under housing authority guidelines, the amount of income families spend on housing is capped and subsidized units must pass quality inspections. Residential stability also may be higher among families with assisted than unassisted housing (Coley et al., 2012). Two studies based on national data found that living in public housing had short- and long-term benefits for low-income youth's educational and economic attainment (Currie & Yelowitz, 2000; Newman & Harkness, 2002). Studies of housing vouchers and children's outcomes are very limited; one experimental study found that housing voucher receipt was not consistently associated with children's or adolescents' academic, emotional, or behavioral outcomes (Abt Associates Inc., et al., 2006).

Finally, there is limited extant literature on housing cost and child well-being. One study based on a national, cross-sectional sample found that housing unaffordability, measured as geographic differences in housing prices, may have benefits for low-income children's development (Harkness & Newman, 2005). For adolescents, but not school-age children, living in more unaffordable areas was associated with fewer behavior problems and better schooling outcomes. A follow-up study conducted by Harkness, Newman, and Holupka (2009), using longitudinal, nationally rep-

resentative data, however, demonstrated few differences in academic and behavioral functioning among low-income children whose families lived in geographic locales with high versus more moderate housing costs. Families paying more for their housing may buy better quality in terms of housing, neighborhood, and school characteristics than families paying less, which would support their children's development (Harkness & Newman, 2005). However, greater costs may limit the availability of economic resources for other necessities, potentially inducing financial strain and stress among parents and hence negatively affecting children's and adolescents' development (Conger & Donnellan, 2007; Mistry, Lowe, Benner, & Chen, 2008).

In sum, prior studies provide some evidence for links between specific housing characteristics and children's development, but findings to date are inconclusive with regard to several key issues including which housing features are most salient for children's development, notably for which child outcomes (e.g., cognitive, emotional, and/or behavioral functioning) and at which developmental periods (e.g., childhood and/or adolescence). These gaps in knowledge are due at least in part to the fact that extant research has not taken a comprehensive approach to children's housing contexts, often focusing on a single dimension of housing, a situation that limits our understanding of how features of the housing context jointly influence child outcomes. In addition, past research generally has not attended to children's socioemotional functioning, a central arena of well-being. Nor has much of this work concurrently addressed children in different developmental periods, permitting identification of potential developmental differences in links between housing and children's well-being. Finally, some past research has inadequately attended to the importance of selection into housing, leaving open questions concerning whether housing contexts or other characteristics and behaviors of families are responsible for associations with child and adolescent well-being.

Developmental Differences

In assessing research on housing and children's outcomes, it is important to consider children's needs at different developmental periods. Because young children spend more time at home and may be more vulnerable to contextual influences than adolescents (Shonkoff & Phillips, 2000), certain housing characteristics are likely to be salient for their development. For example, research on family economic circumstances indicates that exposure to poverty during early childhood is more detrimental for cognitive development than exposure during middle childhood or adolescence (Duncan & Brooks-Gunn, 1997), suggesting that housing cost burdens may be particularly important for younger children. Similarly, young children are more reactive to environmental pollution (Evans, 2004), and thus the quality of housing may be most important during this developmental period.

The specific developmental needs of older children and adolescents, who spend increasing amounts of time in extrafamilial contexts (Brown & Larson, 2009; Steinberg & Morris, 2001), raise concerns in relation to other housing features. For instance, residential instability may disrupt schooling and peer networks (Haynie et al., 2006), and thus be detrimental for educational success and socioemotional functioning. Likewise, homeownership may promote adolescents' achievement compared with rent-

ing (assisted or unassisted) because it provides greater stability and possibly access to higher quality schools (Aaranson, 2000; Haurin et al., 2002). Thus, in exploring associations between housing contexts and children's development, it is essential to consider children's developmental status as a potential moderator and to identify the possible mechanisms through which these associations operate.

Explanatory Processes

Our conceptual model, described earlier, purports that the housing context may have direct as well as indirect associations with children's development. We propose that parental functioning and family processes are a primary vehicle through which housing may influence children's functioning because of the central role that families play in children's lives throughout development and their interconnection with the housing context (Bornstein, 2008; Leventhal & Newman, 2010). Several researchers have argued that housing may be a major contributor to family functioning, particularly among low-income families (Evans et al., 2003; Sandel & Wright, 2006), but limited empirical research has assessed indirect associations between housing contexts and children's development (Bartlett, 1998; Evans et al., 2010).

Two key theories of family resources inform our hypotheses about how housing contexts may be indirectly associated with particular aspects of child functioning. The family stress model posits that economic hardship and negative financial events are associated with parental stress and depression and partner conflict, which in turn compromise effective parenting (Conger & Donnellan, 2007), and thus foster social and emotional problems for children (Raver, Gershoff, & Aber, 2007). Presuming that aspects of housing, individually or collectively, are manifestations of economic hardship (e.g., low quality, instability) or sources of economic strain (e.g., unaffordable, unassisted), this model points to housing contexts having indirect associations with children's development, particularly socioemotional functioning, via parenting processes related to stress and ineffective parenting.

An economic perspective argues that parents invest in their children's future success through work, which generates income that enables them to purchase services and goods that benefit children's development (Becker & Tomes, 1986). Parents may buy high-quality housing, for example, or prioritize homeownership as a way to provide a supportive environment for their children's development. In addition to monetary resources, parents also invest their time and availability in children by providing support and supervision. Devoting more energy to work and income generation to afford better housing, for example, may compromise parents' time and availability for their children, limiting their ability to effectively manage their children's daily routines, and adversely impinging on children's cognitive and socioemotional development (Chase-Lansdale et al., 2003). Although these theoretical models provide intriguing hypotheses regarding how family processes may serve as a mechanism through which housing is influential for child development, no research to date has comprehensively assessed how various aspects of housing foster or inhibit family processes and in turn affect children's healthy development.

The Current Study

The goals of this study were to use a comprehensive approach to assessing links between low-income children's and adolescents' housing and their development by (a) investigating multiple aspects of housing simultaneously (quality, stability, type, and affordability), (b) examining a range of child and youth outcomes (cognitive skills, emotional, and behavioral problems), (c) considering whether links between housing contexts and child functioning were moderated by child age, and (d) exploring whether housing characteristics have indirect associations with children's development via family processes (maternal psychological distress, parenting stress, and family routines). Seeking to improve on some of the methodological weaknesses of prior research, we assessed a representative sample of low-income urban families, providing generalizability; attended to individual, family, and local factors that may differentially select families into housing contexts; and used longitudinal modeling techniques that allowed for better controls for unmeasured heterogeneity. On the basis of past research and theory, we make the following hypotheses. First, we expect that housing quality will be positively associated with children's cognitive, emotional, and behavioral functioning, particularly for younger children—with associations operating in part through family stress. Second, housing instability is hypothesized to be negatively associated with functioning, particularly for adolescents, with indirect effects occurring via family stress. Hypotheses for housing type and cost burden are less clear, but we tentatively expect that owned and assisted housing will be most relevant to adolescents' cognitive development, whereas greater cost burden is expected to be most central for young children's development, particularly their cognitive functioning, with indirect effects operating by means of family routines.

Method

Participants

Analyses drew on data from the main survey component of the *Three-City Study*, a longitudinal, multimethod study of the well-being of low-income children and families in the wake of welfare reform (for a detailed description of the research design, see Winston et al., 1999). The Three-City Study survey began in 1999 with a stratified, randomly selected sample of over 2,400 low-income (< 200% federal poverty line) households drawn from moderate- and high-poverty (>20% families in poverty) neighborhoods in Boston, Chicago, and San Antonio. One designated focal child was included in each family, split into a child cohort (aged 0–4 years) and an adolescent cohort (10–14 years). The child's biological mother (90%) or primary female caregiver (10%; all referred to as *mothers*) was the primary respondent in each family. The sample was interviewed three times over a 6-year period, in 1999 (90% screening rate and 83% interview completion rate among eligible families, leading to overall response rate of 74%), 2000–2001 (88% retention rate), and 2005 (80% retention rate of Wave 1 respondents).

The analytic sample included both the child and adolescent cohorts, incorporating data from all three waves of the survey such that children ranged in age from infancy through age 21. Children aged less than 2 years ($n = 344$ in Wave 1 and $n = 36$ in Wave

2) were excluded from analyses because the measures of child functioning were not appropriate for infants. In addition, youth who had moved out of their natal home by the third wave ($n = 121$) were omitted from the sample because housing data were not collected for this group, and the family process measures no longer represented their proximal contexts. The final sample included 2,437 children (see Table 1).

The level of missingness in the data was very low, averaging only 3.6% across analytic variables. To address missing data due to attrition and item nonresponse, multiple imputation using a bootstrap-based expectation maximization Bayesian algorithm (Honaker & King, 2010) in R was used to create 10 complete data sets. In addition, all analyses incorporated probability weights, which adjust for the sampling framework and differential response, allowing us to make inferences to our population of interest, which includes low-income children and adolescents living in low-income neighborhoods in Boston, Chicago, and San Antonio. Children averaged 10 years of age, and half were male. Just over

40% of the sample was African American, 6% were European American, and 52% were Hispanic, with the largest subgroup comprising Mexican Americans. Other characteristics denote the low human and financial capital of the sample: half the mothers had a high school degree or less, nearly one quarter were receiving welfare, and only one third of mothers were married.

Measures

Unless otherwise noted, all measures were collected during in-home interviews and were assessed in a parallel fashion at each of the three waves. Interviews were completed in English or Spanish with audio computer-assisted self-interview used to improve the validity of reporting on sensitive topics.

Housing characteristics. Measures of the four housing characteristics were reported by mothers and through observational reports by interviewers. The *physical quality* of housing was assessed with both mother and interviewer reports. Eight items were reported by mothers addressing structural, maintenance, and environmental deficiencies such as leaking roofs, broken windows, rodents, heater or stove not working, or peeling paint or exposed wiring, with items similar to those used in the American Housing Survey. An additional four items were assessed by interviewer observational ratings from the Home Observation for Measurement of the Environment-Short Form (Bradley & Caldwell, 1979), addressing unsafe or unclean environments. Items were coded to delineate the presence versus absence of each housing problem indicator and were summed into a count variable of housing quality problems.

Mothers reported the years they had resided in the same household, which was coded into a dichotomous variable of whether the family had moved in the year prior to the interview to designate *residential instability*. *Housing type* was categorized into three groups: families who resided in assisted housing (i.e., voucher-subsidized or public housing), rented, or owned homes. Finally, *housing cost burden* was calculated by the proportion of total housing costs including utilities divided by total household income, with both reported by mothers.

Child and adolescent functioning. Child and adolescent functioning was measured at each wave of the survey through both mother reports and direct assessments. Mothers reported children's emotional and behavioral functioning using the Child Behavior Checklist (CBCL; Achenbach, 1991, 1992; Achenbach & Rescorla, 2001). The CBCL Internalizing scale ($\alpha_{1-3} = .83-.95$) focused on emotional problems, including anxiety, depression, withdrawal, and somatic complaints, whereas the Externalizing scale ($\alpha_{1-3} = .90-.95$) assessed behavioral problems such as aggression and rule breaking behaviors. Standard scores (t scores) were used as continuous measures of internalizing and externalizing problems. To evaluate cognitive achievement, trained field interviewers administered the Woodcock-Johnson Psycho-Educational Battery Revised (WJ-R) Letter-Word Identification and Applied Problems subtests to each focal child to assess their reading and math skills, respectively (Woodcock & Johnson, 1989). Standard scores were used in analyses.

Child and family background characteristics. When seeking to isolate links between housing contexts and children's development, it is essential to attend to the role of selection. Although it was beyond the scope of the current work to

Table 1
Descriptive Data on Study Variables

Variable	<i>M</i> (%)	<i>SD</i>	Range
Child functioning			
Internalizing problems	50.94	10.88	30–92
Externalizing problems	51.59	10.59	30–92
Reading skills	98.83	17.30	50–150
Math skills	95.05	15.83	50–150
Housing characteristics			
Problems	1.74	1.43	0–4
Residential instability	22.01%		
Assisted housing	48.54%		
Private rental	27.52%		
Owned	23.91%		
Cost burden	0.37	0.27	0–1
Family and child covariates			
Child age	10.33	5.36	2–21
Adol cohort	49.94%		
Gender (male)	49.02%		
European American	6.26%		
African American	41.10%		
Hispanic	52.63%		
Biological mother	90.18%		
Employment	51.49%		
Welfare	22.36%		
Less than high school	36.80%		
High school	13.19%		
More than high school	50.01%		
Maternal age	35.78	9.84	16–80
Single	58.36%		
Cohabiting	9.39%		
Married	32.25%		
Family size	4.79	1.78	1–10
Maternal literacy	90.83	16.23	50–150
Immigrant status	21.48%		
Boston	33.58%		
Chicago	33.68%		
San Antonio	32.79%		
Family process mediators			
Psychological distress	1.40	1.10	0–4.25
Parenting stress	2.72	0.86	1–5
Family routines	2.82	0.69	1–4

Note. $N = 2,437$. Time-varying measures were drawn from Waves 1–3 of the survey. Adol = Adolescent.

comprehensively model selection into housing, we attended to a broad range of factors that have been associated with housing selection in prior research and also may affect children's development to more narrowly delineate links between housing and children's development. Time-varying characteristics, which were assessed in each wave of the survey, included indicators for marital status, designated as married, cohabitating, or single, and a count of the number of people living in the household. Economic indicators assessed whether mothers were employed and were receiving Temporary Assistance to Needy Families. Child age was reported in years.

Time-invariant characteristics included child gender and an indicator of whether the child was from the early childhood or adolescent cohort. Other covariates included whether the mother was the biological mother of the focal child; mothers' race/ethnicity, designated as African American, Hispanic, or European American; and mothers' immigrant status. Maternal education and literacy skills, which tend to be quite stable over adulthood, were considered time-invariant. Education was delineated as less than a high school degree, a high school degree or GED, or more than a high school degree, and literacy skills were assessed at the second wave of data collection using standardized scores from the Letter-Word Identification scale from the WJ-R (Woodcock & Johnson, 1989). Maternal age was considered time-invariant (due to time-varying correlations with child age). Finally, we included indicators for each family's city of residence to adjust for local housing markets and policies across the three cities.

Family processes. Family processes were examined using three scales that assessed maternal well-being and family functioning. *Maternal psychological distress* was measured using the 18-item Brief Symptom Inventory (Derogatis, 2000), which assessed symptoms of somatization, depression, and anxiety; higher scores indicated greater psychological distress ($\alpha_{1-3} = .90-.93$). Mothers also reported on their parenting stress with seven items drawn from New Chance (Quint, Bos, & Polit, 1997) and the Panel Study of Income Dynamics (Institute for Social Research, 2010), such as "Being a parent is harder than I thought it would be," ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Items were averaged, with higher scores indicating greater parenting stress ($\alpha_{1-3} = .75-.81$). The Family Routines Inventory (Jensen, James, Boyce, & Hartnett, 1983) was used to examine how often families engage in strength-building behaviors. Participants used a 4-point scale (from 1 = *almost never* to 4 = *always/every day*) to respond to four items (e.g., "Family eats dinner/supper at the same time each night"), which were averaged into a total scale ($\alpha_{1-3} = .64-.74$).

Analytic Techniques

Our choice of analytic technique was driven by a desire to best exploit the strengths of our data, most notably the ability to assess differences between children within a representative sample of low-income urban families and the ability to follow children over time and hence assess within-individual shifts in housing contexts and child well-being. To capitalize on both of these strengths, three-level hierarchical linear models were used to assess trajectories of children's functioning over time, with time (Level 1) nested within individuals (Level 2) nested within cities (Level 3) using Stata 12.0. At Level 1, all of the predictor variables were group-mean centered (e.g., within-person centered). Coefficients on the

time-varying housing variables that were included in Level 1 described whether within-person changes in housing predicted children's development over time, controlling for changes in covariates. Assessment of within-person change provides numerous advantages over other analytic methods (Duncan, Magnuson, & Ludwig, 2004; Johnson, 2005; Singer & Willett, 2003). Controlling for time-invariant unmeasured factors that have a persistent effect on the construct of interest, these models provide important controls over potential omitted variable bias. The slope of child functioning across the three waves was represented with two terms: Age (measured in years) and Age², calculated as the product of the group-mean centered age term multiplied by itself. Hence, the intercept represented each child's average level of development over the three measurement points, whereas the coefficients on Age and Age² represented changes in development over time.

Variation in children's average functioning across the three waves of data (i.e., the intercept) as well as variability in the linear growth terms of children's functioning over time (i.e., the slope) were assessed at Level 2, explained with average levels of time-varying housing variables and covariates as well as time-invariant covariates. In the Level 2 equation, all predictors were grand-mean centered, such that results assessed between-person effects (i.e., average differences). With the exception of Age, all other Level 1 parameters were fixed at Level 2.¹ Finally, in Level 3 we accounted for clustering within cities.

Following the main models, we assessed moderation by cohort (i.e., child vs. adolescent) by adding interactions between each housing characteristic and a dummy variable (uncentered), indicating whether the participant was part of the adolescent cohort. These interactions assessed, at Level 1, whether within-person shifts in housing were associated with functioning differently for children versus adolescents, and at Level 2 whether between-person differences in housing were differentially predictive of average functioning or growth over time in functioning for children versus adolescents. These models were built sequentially, considering one set of interactions at a time and then adding all three sets of interactions together. Results remained stable across models, and hence we present the full interaction model.

The final set of models examined the role of the family process variables (psychological distress, parenting stress, and family routines). First, the main effect models described above were rerun predicting each of the family process measures as outcomes. Second, the models predicting child functioning were rerun, including the family process measures as predictors at both Level 1 and Level 2. The family process variables were tested sequentially and then together in one model, with results remaining quite stable across specifications. Sobel tests were then used to assess the significance of indirect effects.

¹ Unconditional models were estimated to determine the proper specification of time, considering both linear and quadratic time parameters. Overall, the best fitting models suggested the inclusion of both linear (Age) and quadratic (Age²) time parameters, with Age² fixed at Level 2, constraining the residual parameter variance to be zero.

Results

Descriptive Results

Table 1 presents weighted means, standard deviations, and ranges (or weighted percents) for the sample, with data drawn from all three survey waves. These descriptives indicate that housing costs were high, averaging 37% of household income, representing notable housing cost burden. Nearly half (49%) of the sample lived in assisted housing, with 28% in private rentals and 24% in owned homes. Just over one fifth of children had moved in the prior year. Finally, the average family experienced fewer than two housing problems.

Table 2 presents bivariate correlations between within-person averages of housing characteristics, child functioning, and family process variables. Results indicate that housing characteristics as well as family processes were consistently associated with child functioning in expected directions. The correlations between housing characteristics were small to moderate in size, indicating the utility of assessing them concurrently as independent constructs.

Predicting Children's Emotional, Behavioral, and Cognitive Functioning

Within-child effects. Table 3 presents results of the first set of multilevel analyses, with each column presenting model results for one of the four measures of child functioning. The first section shows the coefficients from the Level 1 model, which assessed whether within-person changes in housing contexts predicted within-person shifts in child functioning, controlling for changes in other family characteristics as well as between-person differences in both housing and covariates. Housing problems predicted small changes in children's behavior problems, with a one standard deviation increase in housing problems predicting a .10 standard deviation increase in children's externalizing problems and a similarly sized, albeit trend level increase in internalizing problems (.11 *SD*). However, residential moves in the prior year predicted significant declines in children's internalizing problems, with a one standard deviation difference predicting a .12 standard deviation decline in internalizing score (as well as smaller, trend-level declines in externalizing problems at .05 *SDs*). Residential moves

also predicted significant increases in children's reading skills (.07 *SDs*). Shifts in housing cost and type were not significantly predictive of shifts in child functioning.

Between-child effects. The second and third sections of Table 3 show results from the Level 2 model assessing between-person effects. Children who experienced greater average housing problems exhibited lower average functioning, with a one standard deviation difference in housing problems predicting .18 standard deviation greater internalizing and .24 standard deviation greater externalizing problems, as well as a small trend-level effect of .07 standard deviation lower reading skills. Children who experienced greater residential instability also showed higher levels of average internalizing and externalizing problems, with effect sizes of .12 standard deviations and .15 standard deviations, respectively. Again, no significant results emerged for housing cost or type. The final section shows very limited significant associations between average housing contexts and between-person differences in changes in child functioning over time. One exception indicated that children in assisted housing showed lower growth in internalizing problems than children in rental housing (.02 *SD* lower growth per year).

Alternative model specifications. In addition to the main model specifications, we conducted a number of additional models to test the robustness of findings to alternate operationalizations of main variables and to the addition of covariates. First, we considered nonlinear measures of housing cost, delineating affordable ($\leq 30\%$ of household income) from unaffordable ($> 30\%$) and from highly unaffordable ($> 50\%$ of income) housing costs. Second, we assessed residential instability using moving within the prior 2 years and also with a linear measure of years of residence in the same home. Third, we considered measures of housing quality using only maternal reports and only observational reports. Fourth, we separated public housing from subsidized housing. Fifth, we included family income-to-needs as a covariate. Sixth, we used neighborhood as the Level 3 clustering variable rather than city. Seventh, we used each individual's average age over the three waves rather than the cohort indicator as a time-invariant measure of child age. Across all of these alternate specifications, results did not change substantively from the models presented (available from the authors upon request).

Table 2
Correlation Matrix Displaying Relations Between Average Housing and Family Characteristics and Child Functioning

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. Internalizing	—											
2. Externalizing	.67**	—										
3. Reading skills	-.09**	-.15**	—									
4. Math skills	-.10**	-.11**	.49**	—								
5. Problems	.14**	.16**	-.07**	-.05**	—							
6. Residential instability	.06**	.06**	-.05**	-.03*	-.07**	—						
7. Assisted	.05**	.06**	-.02*	-.07**	-.00	-.09**	—					
8. Owned	-.03**	-.03**	.03**	.07**	-.02	-.07**	-.47**	—				
9. Cost burden	-.04**	-.04**	.01	.04**	.00	.04**	-.34**	.14**	—			
10. Psychological distress	.37**	.32**	-.03**	-.05**	.13**	.08**	.07**	-.08**	-.05**	—		
11. Parenting stress	.36**	.40**	-.03**	-.03**	.09**	.06**	.04**	-.04**	-.02	.36**	—	
12. Family routines	-.15**	-.20**	.01	.06**	-.08**	.04**	-.02	.00	.01	-.16**	-.20**	—

* $p < .05$. ** $p < .01$.

Table 3
Multilevel Growth Models of Housing Characteristics and Child Functioning

Variable	Internalizing		Externalizing		Reading skills		Math skills	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
Level 1								
Child Age	-.71 [†]	.39	.51	.71	-1.03	1.18	-.40	.96
Child Age ²	.54*	.21	.37*	.18	.49*	.15	.32*	.15
Housing characteristics								
Problems	.84 [†]	.48	.74*	.22	.23	.40	-.56	1.27
Residential instability	-3.09*	.93	-1.30 [†]	.68	3.12*	1.22	-2.34	2.12
Assisted	-.55	1.66	-.54	1.57	-2.82	2.75	2.95	2.24
Owned	2.41	2.13	.23	1.38	-.74	2.41	-.34	1.82
Cost burden	-2.81	4.29	-2.99	4.30	-.78	1.73	-2.07	1.83
Family and child covariates								
Employment	-1.46	1.21	-.79	1.05	.28	1.62	-.23	1.27
Welfare	0.82	1.39	-2.08 [†]	1.19	-.33	2.95	1.10	1.36
Cohabiting	-.22	1.25	-1.25	1.88	1.46	1.89	1.52	2.59
Married	0.53	2.22	-0.84	2.10	1.15	1.98	-.53	1.21
Family size	-.32	.50	.21	.34	.06	.42	-.46	.53
Level 2 predicting intercept								
Housing characteristics								
Problems	1.40**	.33	1.76**	.20	-.81 [†]	.44	-.56	.52
Residential instability	3.24*	1.35	3.85*	1.62	-1.96	2.18	-.82	.94
Assisted	.83	1.90	1.11	2.20	.57	1.75	-.46	1.40
Owned	.37	0.94	-.07	0.78	-.58	1.60	.65	.87
Cost burden	-.82	1.87	-1.55	2.20	1.00	2.98	2.11	2.03
Family and child covariates								
Adol cohort	3.22**	.63	2.56**	.40	.01	3.62	-.71	.64
Child gender (male)	.67 [†]	.34	-.40	.40	-2.25**	.41	-.58	1.16
Euro American	1.26*	.61	1.59*	.72	1.38	2.16	.68	1.29
Hispanic	.68	1.49	-.55	.81	2.12*	.62	-.34	1.33
Biological mother	-1.97*	.68	-3.14**	.68	1.09	1.31	2.34*	1.09
Employment	-.94	.73	-.13	.60	-.31	2.72	.19	2.96
Welfare	.68	1.59	.84	1.02	-1.15	2.65	-2.07	2.10
Less than high school	-1.23	1.10	-.69	.91	-1.26	1.93	-3.88*	1.22
More than high school	-1.89	1.33	-1.23*	.61	3.15*	1.30	.46	1.39
Maternal age	-.17**	.04	-.11**	.02	-.08*	.02	.01	.03
Cohabit	2.97 [†]	1.70	2.95*	.99	-5.58*	1.67	-1.17	1.74
Married	-.64	.61	-2.26*	.61	1.45	2.89	3.27*	1.27
Family size	-.00	.14	.24	.25	-.49	.49	-.24	.32
Maternal literacy	.01	.02	.01	.01	.19**	.02	.08*	.04
Immigrant status	.26	.93	-1.59	1.13	3.24**	.49	0.96	0.78
Boston	.18	.42	-.06	.57	1.68*	.43	.59	.66
San Antonio	-.84	.86	-.39	1.09	-1.44*	.67	3.01*	1.06
Level 2 predicting slope								
Housing characteristics								
Problems	-.09	.09	-.05	.08	.08	.17	.06	.22
Residential instability	.20	.34	.42	.35	-.00	.64	.45	.66
Assisted	-.54*	.18	-.28	.35	.29	.45	.73	.59
Owned	-.54	.18	-.40	.28	-.26	.57	.18	.27
Cost burden	-.64	.72	-.10	.80	.30	.92	-.47	.73
Family and child covariates								
Adol cohort	-.17	.22	-.02	.47	-1.38*	.67	-3.16**	.05
Child gender (male)	-.10	.17	.14	.19	-.13	.20	.32*	.16
Euro American	-.05	.46	.04	.47	.21	.36	-.37	.50
Hispanic	.29	.28	.19	.25	.67	.40	.52 [†]	.31
Biological mother	.31	.32	-.25	.29	-.98	.89	-.10	.55
Employment	-.33	.34	-.21	.37	.54	.38	.26	.50
Welfare	.57	.46	.10	.24	-.19	.64	.60	.55
Less than high school	-.50	.49	-.44*	.16	.86*	.33	-.43	.55
More than high school	-.13	.42	-.06	.28	1.15*	.49	-.33	.46
Maternal age	.00	.02	-.02	.02	-.00	.03	-.00	.03
Cohabit	-.00	.70	-.65	.61	.38	.49	.28	.51
Married	.01	.13	-.12	.27	.57	.66	.43	.55
Family size	-.00	.14	.00	.06	.10	.09	-.11	.10
Maternal literacy	-.01	.00	.00	.01	.02*	.01	-.00	.01

(table continues)

Table 3 (continued)

Variable	Internalizing		Externalizing		Reading skills		Math skills	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
Immigrant status	.28	.32	.19	.17	-.23	.62	.19	.71
Boston	.01	.13	-.23 [†]	.13	-.03	.25	-.46	.26
San Antonio	.20	.18	-.27	.25	.05	.29	-.46 [†]	.32

Note. $N = 2,437$. Coef. = Coefficient; Adol = Adolescent.

[†] $p < .10$. * $p < .05$. ** $p < .01$.

Developmental Differences in the Relationship Between Housing Characteristics and Child Functioning

The prior models considered the entire sample of children and youth, spanning a very wide age range from 2 to 21 years. The next set of analyses assessed whether links between housing contexts and children's functioning were moderated by cohort (child vs. adolescent), with results presented in Table 4. Although these models included all of the covariates listed in Table 3, only coefficients for the main effects of housing and interactions

between housing and child age are shown for the sake of parsimony.

The first section presents cross-level interactions between the cohort indicator and the Level 1 time-varying housing terms to assess whether the effects of within-person shifts in housing contexts differed between the child and adolescent cohorts. One significant interaction emerged, indicating that increases in housing costs were predictive of internalizing and externalizing (at trend level) more negatively for children than for adolescents. We next considered whether cohort moderated the between-person effects at Level 2. Results revealed that adverse associations between

Table 4

Multilevel Growth Models of Housing Characteristics and Child Functioning: Cohort Interactions

Variable	Internalizing		Externalizing		Reading skills		Math skills	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
Level 1								
Problems	.92	.39	.67	.51	-.46	1.56	-1.99	2.33
Residential instability	-3.75 [†]	1.63	-1.21 [†]	.53	3.01	1.92	2.24	3.65
Assisted	-1.07	2.11	-.33	1.08	-4.53	3.85	3.42	2.97
Owned	4.20	2.77	1.18	2.45	-1.48	4.19	3.17	2.92
Cost burden	-6.09	5.09	-7.01	6.05	-1.71	3.74	-3.42	5.02
Adol Cohort × Problems	-.12	.51	.12	.75	1.18	2.13	2.44	1.82
Adol Cohort × Res Inst	1.22	2.14	2.29	2.20	.22	2.16	.28	4.04
Adol Cohort × Assisted	.83	3.61	-.96	1.94	3.95	3.96	-.55	2.75
Adol Cohort × Owned	-3.22	2.46	-1.58	3.01	1.66	5.01	-.27	2.27
Adol Cohort × Cost	5.79*	2.41	7.09 [†]	3.86	1.50	7.27	2.20	6.86
Level 2 predicting intercept								
Problems	1.39**	.46	1.52**	.40	.02	.46	-.47	.63
Residential instability	1.40	1.96	2.62	1.68	-.41	2.15	-1.50	1.94
Assisted	1.73	1.68	1.68	1.86	-.67	1.21	-2.19	1.85
Owned	1.82	1.56	.45	1.02	3.00	2.77	2.14	2.56
Cost burden	-.52	1.76	-.09	2.69	2.35	3.39	1.61	2.71
Adol Cohort × Problems	-.00	.67	.40	0.70	-1.74 [†]	.92	-1.82*	.66
Adol Cohort × Res Inst	4.73	3.58	3.03	3.70	-3.75 [†]	2.10	2.10	3.71
Adol Cohort × Assisted	-1.53	1.08	-.87	1.18	2.90	2.08	3.87*	1.63
Adol Cohort × Owned	-2.32	1.80	-.56	1.29	-5.80	5.08	-1.86	2.68
Adol Cohort × Cost	.03	4.38	-2.83	2.27	-2.90	6.08	.62	3.30
Level 2 predicting slope								
Problems	-.11	.20	-.03	.20	.09	-.10	-.12	.42
Residential instability	.35	.45	.72 [†]	.40	.05	-.34	.47	.75
Assisted	-.69*	.31	-.41	.38	.27	-.13	.33	.81
Owned	-1.15**	.38	-1.04**	.24	-.22	-.23	.49	1.13
Cost burden	-.12	.91	.56	.86	.30	-.76	-.96	1.19
Adol Cohort × Problems	.02	.31	-.06	.33	.38	.23	.34	1.86
Adol Cohort × Res Inst	-.63	.62	-.99	.69	.78	1.03	-.60	.88
Adol Cohort × Assisted	.28	.54	.21	.40	.79	.66	.15	.90
Adol Cohort × Owned	1.18*	.55	1.06*	.39	.02	.67	-.63	1.78
Adol Cohort × Cost	-1.65	1.01	-1.36 [†]	.75	2.19	.27	1.12	1.49

Note. $N = 2,437$. All models contain the set of covariates shown in Table 3. Coef. = Coefficient; Adol = Adolescent; Res Inst = Residential Instability.

[†] $p < .10$. * $p < .05$. ** $p < .01$.

housing problems and math skills were stronger among adolescents, with a similar pattern found at trend level for reading skills. In contrast, living in assisted housing (vs. private rental housing) was associated with math skills unfavorably among children but favorably among adolescents. One pattern also emerged in relation to slope effects: Living in owned homes (vs. rented) was associated with significantly declining growth in both internalizing and externalizing problems for younger children, associations that diminished for adolescents. We reestimated these interactive models using a continuous measure of children's average age rather than the dichotomous cohort indicator, finding a similar pattern of results (results not shown).

The Role of Family Processes in the Relationship Between Housing Characteristics and Child Functioning

Because there were limited differences in associations between housing characteristics and child functioning depending on child age, we returned to the full sample main effect models to assess the role of family processes. Results of models predicting family processes indicated that at Level 1, within-individual shifts in housing problems predicted mothers' heightened psychological distress ($B = .17$; $SE = .05$, $p < .001$) and parenting stress ($B = .12$; $SE = .05$, $p < .05$). Considering the Level 1 results from models predicting child functioning (see Table 5), we see that increases in psychological distress and parenting stress were asso-

ciated with increases in children's internalizing and externalizing problems. In addition, the effects of within-person shifts in housing problems on children's functioning decreased notably from main effects models in Table 3, with the coefficients dropping by about 80% for internalizing and 70% for externalizing, both to nonsignificant levels. Sobel tests provided further support for mediation, indicating that the indirect effects from housing problems through both psychological distress and parenting stress to children's internalizing and externalizing problems were all significant, ranging from 1.82 ($p < .05$) to 2.48 ($p < .01$). In contrast to the significant mediation of the housing problems results, residential instability did not predict family processes, and effects of residential instability on child functioning were not altered with inclusion of family processes.

At Level 2, we also found evidence that family processes mediated associations among housing problems and children's functioning. Models predicting family processes revealed that families with greater average housing problems had mothers who reported greater average psychological distress ($B = .15$; $SE = .04$, $p < .01$), greater parenting stress ($B = .11$; $SE = .02$, $p < .001$), and fewer family routines ($B = -.05$; $SE = .02$, $p < .05$). In models predicting child functioning (see Table 5), average levels of maternal psychological distress and parenting stress both predicted higher average levels of children's internalizing and externalizing behaviors. Average family routines also predicted lower levels of children's externalizing behaviors. In these models,

Table 5
Multilevel Growth Models With Family Process Mediators

Variable	Internalizing		Externalizing		Reading skills		Math skills	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
Level 1								
Problems	.16	.30	.22	.26	.08	.49	-.62	1.33
Residential instability	-3.39**	1.07	-1.50 [†]	.78	2.81**	1.05	2.27	2.07
Assisted	-.51	1.82	-.54	1.67	-2.33	2.53	3.03	2.39
Owned	2.28	1.67	.07	1.82	-1.50	2.52	-.43	1.99
Cost burden	-2.06	3.63	-2.34	3.64	.23	1.21	-1.90	1.89
Psych. distress	1.60**	.44	0.92*	.39	1.51	.92	.42	.92
Parenting stress	2.91**	.45	2.50**	.90	-1.99 [†]	1.17	-.21	.52
Family routines	-1.38**	.71	-1.54**	.41	-2.37 [†]	1.22	-.20	.52
Level 2 predicting intercept								
Problems	.59*	.28	1.00**	.27	-.82 [†]	.40	-.51	.55
Residential instability	1.79**	.58	2.76**	.85	-2.07	2.16	-.75	.92
Assisted	.41	1.12	.78	1.51	.33	1.77	-.58	1.28
Owned	.82	.93	.34	.61	-.54	1.48	.64	.87
Cost burden	-1.07	1.61	-2.23	1.86	.88	2.99	1.98	2.03
Psych. distress	3.27**	.38	1.73**	.22	-.37	.51	-.69	.84
Parenting stress	2.33**	.69	3.42**	.38	1.30	1.10	.90	.93
Family routines	-1.53	1.25	-2.61**	.86	1.50	.95	.87	.80
Level 2 predicting slope								
Problems	-.12	.10	-.07	.10	.05	.19	-.02	.28
Residential instability	.20	.26	.44	.28	.01	.70	.20	.54
Assisted	-.47**	.17	-.24	.32	.26	.49	.46	.47
Owned	-.37	.34	-.37	.31	-.29	.63	.30	.31
Cost burden	-.72	.65	-.13	.79	.09	1.07	-.37	.63
Psych. distress	.12	.13	.12*	.05	-.03	.23	.18	.26
Parenting stress	-.02	.14	-.09	.16	.24	.31	.29	.19
Family routines	.19	.19	.22	.18	-.14	.20	-.10	.51

Note. $N = 2,437$. Models contain the full set of covariates shown in Table 3. Coef. = Coefficient; Psych. = Psychological.

[†] $p < .10$. * $p < .05$. ** $p < .01$.

the Level 2 coefficients for housing problems decreased with the addition of the family process variables by about 60% in models predicting children's internalizing problems and 40% in models predicting externalizing. Sobel tests confirmed significant indirect effects from housing problems through both maternal psychological distress and parenting stress for children's internalizing and externalizing problems (ranging from 2.88, $p < .01$ to 4.69, $p < .001$). A significant indirect effect also was found from housing problems through family routines to children's externalizing problems (1.93, $p < .05$).

The Level 2 results also identified some mediation of associations among residential instability and children's functioning. Higher average residential instability predicted heightened psychological distress among mothers ($B = .33$; $SE = .15$, $p < .05$), and in the models predicting child functioning, coefficients for residential instability decreased by about one half and one third for children's internalizing and externalizing problems, respectively. Sobel tests again found evidence of significant indirect effects (both 2.12, $p < .05$). Finally, we note that the much more sporadic associations between housing characteristics and children's reading skills were not mediated by the family processes under consideration, neither was the association between assisted housing and lower growth in children's internalizing problems.

Discussion

A growing body of empirical and conceptual research is seeking to understand the role of housing contexts for children's and adolescents' development (Leventhal & Newman, 2010). One of the main limitations of prior research, however, is that it has not simultaneously considered multiple important aspects of housing contexts to try to disentangle their relative contributions. Given that housing characteristics are often related, it is essential to consider numerous aspects of housing contexts concurrently. The primary contribution of this study was assessment of housing quality, stability, type, and cost in a coordinated manner within a large, representative sample of low-income children and adolescents living in low-income urban neighborhoods, followed over a 6-year period. One of the strengths of our analytic technique was the ability to examine both within-person changes in housing contexts and between-person differences in housing, exploring links with children's emotional, behavioral, and cognitive functioning over time. Because of the broad age range of children studied, spanning 2 through 21 years, analyses were able to test whether similar links between housing and child functioning were found in children versus adolescents. Finally, we assessed whether central family processes help to explain associations between housing and child functioning.

The Importance of Housing Quality for Children's Emotional and Behavioral Functioning

Within the four characteristics of housing considered in this research, poor quality housing was the most consistently and strongly predictive of children's well-being across the span of childhood. As expected, housing quality was associated with children's and adolescents' functioning, and it was so in relation to both within-person shifts and between-person differences. More specifically, children who resided in lower quality housing showed

greater emotional and behavioral problems than their peers in higher quality homes. The more conservative and stringent within-person portion of the hierarchical models found that when children's housing problems increased over time, their emotional and behavioral problems increased in turn. In addition, living in poorer quality housing was associated with lower average reading and math skills among adolescents more so than young children—contrary to hypotheses. Thus, our study adds to the very limited research based in documenting that housing quality is associated with children's development, notably their socioemotional functioning.

Why might structural or maintenance deficiencies harm children's well-being? We anticipated that family stress would be an important vehicle, and our results indicated that family processes related to both stress and stability were implicated such that low-quality housing may induce stress in parents, increase mental health problems, and limit their ability to regulate family activities, in turn affecting children's socioemotional functioning. Thus, rather than being a source of security and escape from life's pressures, a home with quality deficiencies may add to other stresses experienced by poor families, leading to a cumulative negative impact on well-being. There are a number of other potential avenues for such effects on children that were not explored in this study. For example, environmental hazards like lead paint, cockroaches, or other safety hazards can lead to negative health consequences for children, ranging from asthma and allergies to far more serious neurological problems (Leventhal & Newman, 2010); these in turn may harm children's cognitive abilities as well as their ability to regulate their emotions and behaviors. Similarly, other housing problems such as a lack of heat, hot water, or adequate light can inhibit children's engagement in both playful and learning activities and negatively impact their social activities (Bartlett, 1998), all of which might influence both their emotional and behavioral functioning as well as cognitive skills. In this research, the measure of housing problems was a sum score of the presence or absence of a number of distinct physical deficiencies. A richer portrayal of the extent of deficiencies or the perceived impact on maternal and child functioning would help to move the field forward in delineating the most important aspects of housing quality.

The Mixed Role of Residential Instability

Residential instability was another aspect of housing that showed significant associations with children's emotional, behavioral, and cognitive functioning. Interestingly, however, patterns differed in the two levels of the hierarchical models, thus only partially supporting hypotheses. When considering within-person shifts in residential instability, assessed as whether families had moved in the year prior to each survey interview, results were counter to expectations in that residential moves were associated with declines in children's internalizing and externalizing problems and with increases in their reading skills. None of the three family process variables we considered helped to explain this pattern. However, in considering between-person differences, results were more in line with expectations (though no developmental differences emerged). Children in families with higher average levels of moves had greater internalizing and externalizing problems in comparison to children with fewer moves, and these

associations were mediated in part by higher levels of maternal psychological distress in families with greater residential instability.

This contrast in results is intriguing and might reflect the effects of single residential moves on short-term shifts in child functioning versus cumulative impacts of more long-term instability. For example, a residential move may represent a chance to improve one's housing context, to access subsidized or more affordable housing, or to move on from a relationship dissolution or difficult family situation (Clark, 2010; Crowley, 2003)—all factors that may enhance children's well-being. However, extensive research has reported that residential instability, especially multiple moves, is disruptive for children and families, often precipitating shifts in social networks and relationships (Haynie et al., 2006; Pribesh & Downey, 1999). Moves similarly may require a school change, which often interrupts the continuity of children's learning and requires adaptation to a new environment (Rumberger, 2003). Parents also may be negatively affected by the stress and disrupted social networks driven by residential instability, a hypothesis supported by our results concerning the meditational role of mothers' psychological distress. It is also important to note that the inconsistency in our results comparing within-person shifts versus between-person differences might reflect the influence of selection factors and unmeasured bias as others studies have suggested (Gasper et al., 2010). Future research should seek to explore the potential trade-offs and processes in effects of residential instability.

Limited Effects of Housing Cost and Type

Beyond housing quality and residential instability, other aspects of housing were not consistently related to children's functioning in the expected manner. In this sample of poor and low-income families, the majority of families were paying greater than 30% of their income toward housing costs, the rate that is considered "unaffordable." Yet, even with a notable range in housing cost burdens, we found no significant links with child functioning in the full sample in models assessing costs linearly or categorically, although interactions results revealed more beneficial links between increases in housing cost burdens and declines in children's emotional and behavioral functioning for young children than for adolescents. The limited evidence linking housing cost burdens to child functioning provides some support for recent debates in the housing literature questioning the perspective that high housing costs are consistently detrimental for children and families (Harkness & Newman, 2005). Rather, these scholars have argued that higher costs may buy greater quality of housing or neighborhood characteristics such as safety, resources, or social capital. Benefits from improved quality may be counteracted by more limited economic resources to devote to other family needs, however, leading to the primarily nonsignificant associations with child functioning as found in this study, which accounted for multiple housing features simultaneously.

Finally, few differences in children's emotional, behavioral, or cognitive functioning emerged in relation to the type of housing in which families resided. Interestingly, we found few benefits of home ownership for child or adolescent well-being in this low-income sample, even though nearly one fourth of the sample lived in owned homes. Research has suggested that for families with

very limited economic resources, the economic stresses and limited residential stability associated with home ownership may counteract potential benefits (Harkness & Newman, 2002; Shlay, 2006). Similarly, results found few benefits or drawbacks to assisted housing in comparison to private rentals; two significant results emerged indicating that assisted housing was linked with less growth in children's internalizing problems and with greater math skills for adolescents than young children. Although subsidized housing is typically more affordable than private market housing options for low-income families, it often brings drawbacks of poor quality neighborhoods and housing costs that increase with rises in family income (Turner & Kinglsey, 2008), potential stressors for low-income families. The possibility that both housing costs and owned or assisted housing has potentially counteracting effects on families was supported by the finding that these housing characteristics also were not significantly associated with maternal functioning or family routines.

Developmental Differences

In considering the overarching patterns of results in this research, it is important to highlight both the similarities and differences in links between housing contexts and children's functioning between children and adolescents. The majority of results in our multilevel models were not moderated by child age as hypothesized. In cases in which significant interactions were found, an unanticipated pattern emerged suggesting that housing characteristics appeared somewhat more influential for younger children's emotional and behavioral functioning and more influential for adolescents' cognitive skills. Specifically, greater costs and owned housing (vs. private rental) were more strongly associated with lower internalizing and externalizing problems over time for children than for adolescents; the association between cost and children's behavioral functioning contrasts somewhat with the literature linking income more strongly to young children's cognitive than socioemotional development. However, better quality housing and government-assisted housing (vs. private rental) were more strongly supportive of adolescents' cognitive skills than children's. We do not want to overinterpret these results, given that the majority of associations between housing and child functioning appeared relatively similar across children of different developmental periods; yet, these results raise important questions concerning the potential role of neighborhood and family resources. For example, adolescents' cognitive skills may be particularly sensitive to the effects of living in low-quality housing because of associations between housing quality and the quality of surrounding neighborhood and school contexts, which adolescents are more exposed to than younger children. In considering the role of housing costs, it is important to note that increases in housing costs may derive from a variety of sources beyond increased rent or mortgage payments, including moves to more expensive housing, the loss of earnings or public benefits, or the exit of family members with income. Such sources of instability might be more influential for younger than older children. An important goal of future research is to explore further these and other processes explaining developmental differences in associations between housing and child functioning.

Housing and Family Processes

A final goal of this research was to take a first step at delineating how central family processes may act as mediating mechanisms linking housing experiences to children's well-being. Drawing on economic and family stress theories, we assessed the role of mothers' psychological distress, parenting stress, and the regularity of family routines. Our mediational analyses found consistent support for the importance of maternal functioning, and less consistent support for the role of family routines. Specifically, as hypothesized, our results indicated that mothers' psychological distress and parenting stress were important processes mediating associations between poor housing quality and children's internalizing and externalizing problems. In line with expectations, results suggested that when housing quality declines, mothers' functioning declines as well, helping to explain decreases in children's socioemotional well-being; similar patterns emerged in the between-person portions of the models. In addition, mothers' psychological distress also explained in part why children in families with greater average residential instability had higher average levels of internalizing and externalizing problems. Together, these results provide some support for a family stress perspective (Conger & Donnellan, 2007) in which housing characteristics may be manifestations of economic strain or function to impose stress on parents, in turn negatively affecting mothers' psychological well-being, ultimately harming children.

Contrary to expectations, in just one case did the regularity of family routines act as a mediator, partially explaining the link between higher average levels of housing problems and children's greater externalizing problems, suggesting that other aspects of parenting, such as disciplinary practices or monitoring, or more targeted assessments of chaos and environmentally induced stress, may be more important parental behaviors to investigate. Interestingly, the within-person shifts in residential instability, which predicted declines in children's internalizing and externalizing problems, were not mediated by the family process measures. As discussed earlier, other important family-, peer-, and school-related changes that children experience when a family moves and that have been linked to children's functioning may be important to consider in future research.

Conclusions

In closing, it is important to reiterate that the analyses in this research were correlational and cannot indicate a causal role of housing characteristics on children's functioning. In relation to our primary measures of interest, most measures were derived from a single reporter, increasing concerns over shared error variance. Although the housing quality measure was more optimal in this respect, incorporating both mother and observer reports, the measure was a simple count variable of the presence of various physical deficiencies, lacking richness concerning the depth of the problems. Although descriptive, our models adjusted for a broad range of characteristics of families which are likely associated with housing contexts and child functioning. The assessment of both within-person shifts as well as between-person differences also helped to control for unmeasured biases inherent in correlational research.

In addition, it is important to underscore that the sample of families assessed in this study was drawn from moderate- and

high-poverty neighborhoods in three U.S. cities, and may not be generalizable to other geographic locations or to other historical time periods. Reflecting the population of poor urban neighborhoods in many U.S. cities including the three under study, the sample was predominantly African American and Hispanic. The housing contexts in other demographic and geographic groups—for example, rural populations—may show different patterns. These data were collected during a time of economic growth, when incomes were rising and housing was gaining in value. The current economic situation is much changed, and hence the processes through which housing affects children may have shifted as well. We also reiterate that although we assessed multiple aspects of families' housing contexts, other important characteristics, such as crowding or neighborhood characteristics, were not assessed.

Beyond these limitations, however, results highlight the importance of considering housing in a multifaceted manner in order to address the underlying connections between multiple aspects of housing contexts. By assessing housing quality, stability, type, and cost in one comprehensive model, this study sought to delineate the relative contributions of these interrelated aspects of housing to children's developmental trajectories in emotional, behavioral, and cognitive realms. Results underscore the central role of poor housing quality as potentially the most potent aspect of housing in inhibiting the healthy development of low-income children and youth, with housing problems showing the most consistent links with children's and adolescents' emotional and behavioral functioning, as well as with adolescents' cognitive skills.

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