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Longitudinal Effects of Student Mobility on Three Dimensions of Elementary School Engagement

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Abstract

Working within the developmental science research framework, this study sought to capture a dynamic and complex view of student mobility. Second- through fifth-grade data (N = 1,003, predominantly Caucasian) were drawn from a longitudinal study, and growth curve analyses allowed for the examination of mobility effects within the context of other factors that put children at risk, including behavior problems and family stress. School changes predicted declines in academic performance and classroom participation but not positive attitude toward school. Time-varying factors such as peer acceptance and teacher support had a positive influence on the growth trajectories of child outcomes. Additionally, teacher support had a particularly strong influence on positive attitudes toward school among children who had more school changes.

Educators and parents have long voiced concern about the effects of school enrollment changes on children's adjustment and achievement (Blane, Pilling, & Fogelman, 1985; Cramer & Dorsey, 1970), and accordingly, the consequences of student mobility have been the focus of numerous studies. A clear finding across this literature is that student mobility, defined as making a school enrollment change at a time not required by the grade structure of the school system, is associated with numerous other risk factors such as poverty, stressful life events (e.g., divorce), poor initial school performance, and a tendency to make additional enrollment changes during subsequent school years (Alexander, Entwisle, & Dauber, 1996; Eckenrode, Rowe, Laird, & Brathwaite, 1995; Kerbow, 1996; Nelson, Simoni, & Adelman, 1996; Pribesh & Downey, 1999). Given the intertwined nature of these factors, it can be difficult to isolate the impact of mobility from other factors that put children at risk for school problems. In a seminal article, Schaller (1976) cautioned researchers to control for preexisting differences when examining the effects of mobility, but not all subsequent researchers have heeded his warning.

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Among the studies that have used controls, results suggest that student mobility has a negative effect on school performance, above and beyond the impact of other stressful features of a child's life (Astone & McLanahan, 1994; Haveman, Wolfe, & Spaulding, 1991; Heinlein & Shinn, 2000; Ingersoll, Scamman, & Eckerling, 1989). Some of the negative consequences associated with student mobility include: lower math and reading test scores (Mantzicopoulos & Knutson, 2000; Texas Department of Education, 1997), an increased risk of behavior problems (Tucker, Marx, & Long, 1998; Wood, Halfon, Scarlata, Newacheck, & Nessim, 1993), and a higher likelihood of being held back a grade (Simpson & Fowler, 1994; Tucker et al., 1998). Student mobility has also been shown to impact school completion and expected educational attainment (Astone & McLanahan, 1994; Hagan, MacMillan, & Wheaton, 1996; Pribesh & Downey, 1999; Rumberger & Larson, 1998; South, Haynie, & Bose, 2007).

Although a preponderance of the mobility research, and the related area of school transitions research (i.e., the study of scheduled enrollment changes to kindergarten, middle, or high school), has focused on either the experience of adolescents or the transition to kindergarten, the current study examines effects of mobility during the elementary school period. The gap in our knowledge is noteworthy because school mobility during the elementary school years may be strongly linked to long-term measures of school success, such as high school completion (Alexander et al., 1996; Haveman et al., 1991; Heinlein & Shinn, 2000).

How might enrollment changes made during elementary school influence long-term outcomes? Dropping out of school has been described as a developmental process of disengagement that may have its roots in the earliest grades (Finn, 1989; Rumberger, Larson, Ream, & Palardy, 1999). Research has shown that a scheduled transition to middle school or high school represents a dramatic environmental shift and a potential misfit for students that can begin to deteriorate some students' commitment to and sense of belonging at school (Alspaugh, 1998; Eccles & Midgley, 1990; Seidman & French, 1997). For elementary-age students making unscheduled school changes, this deterioration may be intensified because they typically are not involved in the decision to move and often face the adjustment process without the benefit of planned orientations (Jason et al., 1992). Additionally, researchers have concluded that elementary school mobility may have particularly harmful effects on academic performance because moving disrupts the acquisition of the critical building blocks on which later learning is based (Kerbow, 1996; Lash & Kirkpatrick, 1990).

In the present study, we sought to expand our understanding of how mobility during the elementary school years may contribute to the process of disengagement with school just prior to the significant changes that await children in adolescence. We wanted to improve on prior research and found the developmental science framework (Magnusson & Cairns, 1996) to be an instructive guide in determining our approach. The framework emphasizes that dynamic change occurs when individuals face environmental change, and it is therefore important to study adaptations to change "moment to moment," as the individual interacts with new features of the environment. Capturing the "emergence, dynamics, and pathways of change" in individual development (Magnusson & Cairns, 1996, p. 9) requires an analysis of longitudinal data. Typically, mobility researchers have used cross-sectional and retrospective designs and examined endpoint measures such as high school completion rates. In the context of this study, we chose to examine yearly measures of engagement and school experiences to allow us to consider temporal changes in exacerbating, confounding, and protective variables. We also determined that a multi-level analysis of the data would provide the best means to consider stable child characteristics as well as time-varying covariates that may impact individual students at each occasion of a school transfer (Raudenbush & Bryk, 2002; Snijders & Bosker, 1999).

Within the developmental science framework, it is recommended that researchers view the individual within a complex set of systems, taking into account the reciprocal process of an individual's interaction with the environment. Specifically, it is proposed that "variables in the developmental processes of individuals cannot be effectively studied if they are divorced from the social and environmental contexts in which they occur" (Magnusson & Cairns, 1996, p. 13). In the current study, we examine data from child, family, and school systems and focus attention on how school engagement outcomes are influenced by factors present in the school environment.

Among the challenges of conducting the type of research outlined in the developmental science framework is the retention of subjects (Magnusson & Cairns, 1996). Indeed, a number of the previous longitudinal studies of at-risk and mobile elementary-age students have lost between 20% and 25% of the original study population (see Alexander et al., 1996; Heinlein & Shinn, 2000; Temple & Reynolds, 1999). To ensure that the experiences of students who may be the most negatively affected by mobility were included, we used data from a study in which 94% of subjects were retained through the elementary grades (Fleming, Harachi, Catalano, Haggerty, & Abbott, 2001; Haggerty, Catalano, Harachi, & Abbott, 1998).

The Impact of Social Ties: Coleman's Theory of Social Capital and Vygotsky's Theory of Appropriation

One of the theories used commonly in the literature to explain the link between mobility and poor educational outcomes is the "social capital" theory of Coleman (1988,1990). Closely related to the economic concepts of human and financial capital, social capital represents the relationship between the parents and the child and the network of relationships between parents, friends, and community members that may provide support to the family (Coleman, 1988). According to the theory, moving harms children's achievement because social ties are broken, thereby disrupting the exchange of social capital in the network. A number of controlled studies have drawn on Coleman's theory to explain how mobility, social capital, and achievement may be related (Hagan et al., 1996; Pribesh & Downey, 1999; South et al., 2007; Tucker et al., 1998). Because Coleman proposed a variety of indicators of social capital, each study uses a different measure of social capital.

In their study of mobility and high school dropout rates, Hagan et al. (1996) focused on the quality of the child's relationship with their parents and the father's level of participation in the family. They determined that "mother's support and father's participation are important sources of social capital that can mitigate the disruptive effects of family migration" (p. 381). In an attempt to broaden the definition to include social ties outside the family, Pribesh and Downey (1999) used six different measures of social capital, including participation in high school extracurricular activities, the frequency with which students discuss course planning with peers or parents, and the amount of contact parents have with other parents and school personnel. Moves were associated with declines in nearly all these measures of social capital, although higher levels of social capital appeared to buffer the negative effect of moving on test scores and educational attainment goals. Pribesh and Downey were also concerned about the impact of family stress experiences as a proxy for diminished social support. They determined that students whose parents divorced or who had one parent marry or die experienced declines in test scores independent of other variables. Finally, South et al. (2007) examined parent-child social ties, as well as other factors that might explain the higher dropout rates among mobile high school students, including psychological well-being (e.g., depression, self-esteem), school engagement, and peer friendships. They determined that for adolescents, lower levels of "peer network structure," measured by a student's place

in a peer network and the density of the structure, provided the best explanation of movers' higher dropout rates.

This body of research has expanded our understanding of student mobility in a number of ways. First of all, most of these authors attended to both risk and protective factors in testing the impact of mobility. The typical approach has been to focus on how the severing of ties to familiar people and routines may negatively impact students. Research has shown, however, that not all highly mobile children suffer negative consequences (Kerbow, 1996; Mantzicopoulos & Knutson, 2000; Tucker et al., 1998). One result of the social capital research is that we are beginning to understand more about the factors that protect mobile children from harm following a school change. In particular, social support from family and peers appears to be powerful moderators of outcomes for mobile students. Still absent from the literature is a comprehensive study of the role that teachers play in supporting mobile children.

Additionally, by considering different spheres of influence surrounding the child and defining social capital in multiple ways, the authors who have examined social capital have tried to illuminate the complex relationship between mobility and educational outcomes. This approach has led to greater understanding, for example, of the role of stressful family events, such as divorce, that may operate independently of changing schools to erode the support that children need to succeed in school. Unfortunately, the lack of definitional clarity has been one of the criticisms of social capital theory in recent years (see Durlauf, 1999; Morrow, 1999), leading one author to conclude that social capital is better construed as a "descriptive construct rather than an explanatory model" (Morrow, 1999, p. 760). In the context of the present study, we determined that a test of "social ties" within the school environment was more appropriate than a test of social capital per se. Here, we are interested in how social ties with teachers and peers in the school environment serve to support successful outcomes for students experiencing family stress and/or mobility.

Complementing the perspective of social capital theory, Vygotsky's (1962,1978) sociocultural theory of "appropriation" describes the processes through which supportive teacher and peer relationships may provide an important positive influence for mobile children. Summarized by Thompson (1998), the model of appropriation "underscores how social interaction provides the medium by which socioemotional skills, understanding, and perspective are jointly created as the child participates with others in shared activity, whether consisting of face-to-face exchanges, collaborative play, or the soothing of fears or distress" (Thompson, 1998, p. 27).

Important from a mobility perspective, Vygotsky emphasized that adaptation to the environment is achieved by social means (Goldstein, 1999; van der Veer & Valsiner, 1994; Wertsch, 1985). When we consider the experience of the child who has just changed schools, perhaps overwhelmed by the new physical space and mourning the loss of friends in a previous school, we expect that there may be a period of adjustment during which time the child may not show signs of academic progress (Kerbow, 1996; Vernberg, 1990). Once past the orientation stage (e.g., becoming acquainted with the schedule of daily activities and academic/behavioral expectations), we hope that a child will not only adapt to the new setting but also begin to develop social and academic skills at the same rate as before moving. Drawing on the theory of appropriation, what creates a bridge between bewilderment and success in the new setting is helpful social contact with a teacher and peers.

Empirical evidence to support the role of social contacts in mitigating stressful life events for children is abundant (DuBois, Felner, Meares, & Krier, 1994; Garmezy, 1983;

Hendershott, 1989; Sandler, Miller, Short, & Wolchik, 1989; Wenz-Gross, Siperstein, Untch, & Widaman, 1997), with research indicating that strong connections among students, teachers, and positive peers facilitate access to social and scholastic activities (Hughes, Cavell, & Willson, 2001; Ladd, Birch, & Buhs, 1999; Ladd & Burgess, 2001; Wentzel, 1997). Research has also shown that student – teacher relationships characterized as supportive, close, or caring, have significant effects on academic motivation, attitude, and engagement in the school environment (Birch & Ladd, 1997; Wentzel, 1997).

In the area of student mobility, studies of the scheduled transition to middle school or high school indicate that support from peers and teachers positively influences the academic and social adjustment of adolescents (Felner, Ginter, & Primavera, 2002; Hirsch & DuBois, 1992; Isakson & Jarvis, 1999; Lord, Eccles, & McCarthy, 1994). As we have mentioned, less is known about the relational factors that influence the school success of elementary school students making unscheduled school changes. For this study, we are interested in the potential protective qualities of peer and teacher relationships for these mobile students.

School Engagement Outcomes and Mobility

What measures of school engagement do we think might be negatively influenced by mobility and positively influenced by supportive peer and teacher relationships? Recognizing that a number of key shifts in children's attitudes and behaviors may occur when they experience enrollment changes in the early years of schooling, we selected three dimensions of engagement to shed light on the academic, affective, and behavioral facets of school success (Finn, 1989; Finn & Rock, 1997). First of all, we include a measure of teacher-rated academic performance in three core curricular areas—reading, math, and language arts— to confirm the results of previous studies (Kerbow, 1996; Tucker et al., 1998). Second, we include a measure of children's attitudes toward school to tap the affective dimension of school engagement (Alexander, Entwisle, & Horsey, 1997). We included an affective measure because mobility has been linked with increased rates of behavior problems (e.g., suspension, disobedience) in elementary-age students (Tucker et al., 1998; Wood et al., 1993), and though as yet untested, we suspect that the increased difficulties that mobile students experience might erode the positive attitudes students hold about school.

Finally, the development of positive classroom behaviors such as participation and cooperation skills may be compromised when children, lacking consistent reinforcement and support, move from setting to setting. Though untested in the context of mobility, we believe that these "deportment" behaviors are worth examining given the empirical support for their influence on academic performance (Alexander, Entwisle, & Dauber, 1993; Alexander et al., 1997; Ladd et al., 1999). We therefore include a scale called "classroom participation" that indicates the extent to which an individual interacts appropriately with teachers and peers in the classroom.

Current Study

The purpose of this study is to open up a more dynamic view of mobility than has previously been attempted, using longitudinal data to explore how mobility during the elementary school years might undermine or erode the skills and attitudes that typically lead to successful school outcomes. Data from second through fifth grades were drawn from an ongoing longitudinal study in which researchers successfully retained a high percentage of subjects (94%) despite a high degree of mobility within the subject pool (Fleming et al., 2001; Haggerty et al., 1998). Within the design, we considered how risk factors as well as protective factors in the school and home environment might influence academic and behavioral outcomes at fifth grade (see model design in Figure 1).

Children who move, especially frequently, also tend to experience other stressors that make them more vulnerable to school failure. Thus, we included measures of additional risk factors (represented on the left side of the model in Figure 1) in our tests of mobility to understand the stressful context of mobile children's lives. Low socioeconomic status and gender (being male) are included because they have been shown to increase the risks of negative school outcomes for mobile children (Ellickson & McGuigan, 2000; Heinlein & Shinn, 2000; Jason et al., 1992; Mantzicopoulos & Knutson, 2000; Nelson et al., 1996; Tucker et al., 1998; Wood et al., 1993). Initial shy/withdrawn behavior and initial antisocial behavior are included because they have been tied to poor educational outcomes and may hinder the development of relational supports available to mobile students (Coie, Dodge, & Kupersmidt, 1990; Ladd & Burgess, 2001; Wentzel, 1993). We further recognize that when students face chronic stress or concurrent stresses, they have a more difficult time coping (Hetherington, 1979; Hofferth, Boisjoly, & Duncan, 1998; Moore, Vandivere, & Ehrle, 2000; Simmons, Burgeson, Carlton-Ford, & Blyth, 1987; Tucker et al., 1998). We therefore include two variables, total school changes and total stressful life events, to test the cumulative effects of these experiences.

In addition, we included time-varying factors measured at each grade level to determine whether dynamic factors play a role in changing the trajectories of growth for mobile students (Magnusson & Cairns, 1996). Data for these four factors, gathered through child, parent, and teacher surveys, include two risk factors: children's yearly experiences with family stress and school enrollment changes (represented in the top box of the model in Figure 1) and two protective factors: peer acceptance and teacher support (represented in the lower box in Figure 1). The three outcome measures (in the center boxes in Figure 1), representing different behavioral and attitudinal components of school engagement, were taken from teacher and child surveys. These include a measure of teacher-rated academic performance, a measure of classroom participation that indicates that an individual is participating successfully in the academic and social life of the classroom, and a measure of positive attitude toward school to determine how mobility impacts the affective ties that children have toward school. The method of analysis, linear growth curve modeling, allowed us to examine the interactions between the individual, their family circumstances, and their school relationships across time, thereby modeling the complexity of the mechanisms through which mobility may impact school performance and related skills and attitudes (Adelman & Taylor, 1991; Ladd & Burgess, 2001; Reynolds & Bezruczko, 1993).

In summary, this investigation seeks to assess both the short-term effects of mobility, through yearly measures, and trends over multiple years, though cumulative measures. We are further interested in the role that family stress (measured both yearly and cumulatively), teacher support (measured yearly), and peer acceptance (measured yearly) play in influencing student engagement. We sought to answer three questions: First, do experiences with elementary school mobility, measured cumulatively, diminish attitudes toward school and reduce the development of classroom participation and academic performance? Second, do risk factors, including gender, low-income status, antisocial and shy/withdrawn behavior, and overall family stress, play a role in explaining the relationship between mobility and school outcomes? Third, do yearly measures of school change, family stress, peer acceptance, and teacher support impact the development of social and academic outcomes, taking into account other risk factors?

Method

Raising Healthy Children Project

This study analyzed data from the Raising Healthy Children (RHC) project, a prospective longitudinal intervention study conducted by the Social Development Research Group. In

the fall of 1993, 10 public elementary schools in a Pacific Northwest suburban school district were selected because they had student populations with high aggregate measures of risk relative to other schools in the district. Risk was based on the percentage of students having below-average standardized reading scores, living in single-parent households, receiving subsidized school lunches, and experiencing high rates of mobility. Eligibility criteria for the sample included: attending a regular education first- or second-grade classroom, remaining in the project school from the time of parental consent (January 1994) through to completion of the first student survey in the spring of 1994, and having a parent who spoke English, Spanish, Vietnamese, or Korean.

Parents of 938 (76%) of the 1,239 eligible students consented to participation. In the 2nd year of the study, second- and third-grade students who had newly enrolled into a project school were also invited to participate in the study, bringing the overall study cohort to 1,040 students. There were no significant differences on basic demographic characteristics between consenting and nonconsenting families. Data in the RHC project were collected on a yearly basis from district records and from annual parent, child, and teacher surveys administered each spring. Parents received a $10 incentive for survey participation, students received a small gift, and teachers received a $5 incentive for the assessment of each consenting student in their classroom. Particular attention was paid to retaining a maximum number of participants, even if they moved out of the state. A 94% retention rate was maintained at the end of the 5th year of data collection, when students were enrolled in fifth or sixth grade.

RHC is a study of the etiology of problem behaviors as well as a randomized test of a multicomponent preventive intervention. The intervention was delivered at five of the project elementary schools and consisted of instructional staff development for teachers, parenting workshops, booster sessions for parents and teens, summer camps and study clubs for students, and home-based case management services for high-risk students who exhibited academic or behavioral problems. Additional details regarding the RHC intervention have been reported by Catalano et al. (2003), Haggerty et al. (1998), and Brown, Catalano, Fleming, Haggerty, and Abbott (2005).

RHC is an ongoing longitudinal intervention study. An experimental/control variable was included originally in the analytic plan for the present study. In this analysis, experimental effects on the outcomes were examined using both correlational methods and hierarchical linear modeling, but at no point during the analytic process was an experimental effect detected. Therefore, data in this present study were pooled and include children in both the experimental and the control conditions.

Sample

Data on students when they were enrolled in Grades 2 through 5 were used for this study. Of the 1,040 children originally enrolled in the RHC project, 37 were removed from the current analysis. First, 9 students who were homeschooled during the elementary grades were eliminated because they had limited teacher data and lacked school-based experiences important in this study. Second, the statistical design required a complete set of time-invariant individual data for each subject, which reduced the study by another 28 students, leaving a total of 1,003 for the present analysis.

The sample contained roughly equal numbers of boys and girls (471 girls and 532 boys), and 35% of parents reported that their families were low income during one of the first 2 years of the study (n = 355). In terms of mobility, nearly 50% of children remained in the same school during second through fifth grades (n = 497), 33% made one school change (n = 328), 13% made two changes, and 5% of the sample made three or more school changes (n

= 47). For stressful family events, characterized by changes in parental relationships, family experience with job loss, serious accidents or illnesses, or death of a household member, 48% of children (*n* = 478) experienced either zero or one stressful event over the 4-year study period. Twenty-eight percent experienced two or three events (*n* = 276), 14% experienced four or five events (*n* = 143), and 9% (*n* = 90) experienced six or more stressful family events.

In terms of ethnic group composition, the sample represented a population typical of many suburban school districts: 82% (*n* = 818) European American, 7% (*n* = 72) Asian/Pacific Islander, 4% (*n* = 43) Hispanic, 4% (*n* = 43) African American, and 3% (*n* = 27) Native American. The lack of diversity in the sample limited our analysis of race/ethnicity in this study. However, we did examine whether mobility, family stress, and other risk/protective factors were associated with the available categories of race/ ethnicity and found that there were no significant unique associations after controlling for low-income status, gender, antisocial, and shy/withdrawn behavior.

Measures

In the following list of measures, items taken from existing measures cite the source; otherwise, the items were created for use in the RHC project. Means, standard deviations, alpha reliabilities, data source, and data collection points are provided in Table 1.

Outcomes

Classroom participation: A nine-item scale assessing classroom participation was drawn from teacher surveys. The scale consists of items derived from the Walker – McConnell Scale of Social Competency and School Adjustment (Walker & McConnell, 1988) and Teacher Observation of Classroom Adaptation – Revised (TOCA–R; Werthamer-Larsson, Kellam, & Ovesen-McGregor, 1990). Yearly alpha reliabilities for Grades 2 through 5 were .91, .90, .90, and .90. Example items include: (a) interacts appropriately with teacher, (b) cooperates with peers in group activities, and (c) listens while others are speaking. The response options for items ranged from either *rarely or never true* to *often true* or *not at all* to *often true. A* mean score was computed across items so that the scale had a range from 1 to 5.

Positive attitude toward school: A four-item scale assessing a child's attitude toward school was drawn from child surveys administered each year. Items were taken from the Seattle Social Development Project (Hawkins & Catalano, 1990) and the Seattle Personality Questionnaire (SPQ; Kusche & Greenberg, 1988). Items include: (a) Do you think school is fun? (b) Do nice things happen to you at school? (c) Do you feel unhappy at school a lot? (d) Do you look forward to going to school? Response options were *YES, yes, no, NO. A* mean score was computed across items so that the scale had a range from 1 to 4. Though internal consistency was moderate, alpha reliabilities increased as children grew older (α = .55, .62, .70, and .70).

Academic performance: Teacher ratings of a child's academic performance in three content areas (language arts, math, and reading) were collected each year. The 5-point response options for each item were *above average, slightly above average, average, slightly below average*, and *needs improvement. A* scale was created by averaging the three academic areas each year with a range of 1 – 5. Due to the frequent school changes within the study population (across regions and states), we are unable to use standardized test data without compromising the sample retention rate. However, construct validity of our measure of academic performance is supported by a .79 correlation between this measure and a

composite of math and reading scores on the California Test of Basic Skills administered to the students who were still enrolled in the same school district in fourth grade.

Time-Varying Measures

Yearly school changes: A school transfer variable was coded in each of the 4 years as 0 = *no school transfer* and 1 = *one or more school transfers*. Transfers were calculated for the period between June of one school year and June of the next school year using district and school office records.

Yearly family stress: Stressful events in the life of each child were assessed yearly through parent surveys and were summarized into a 0–4 index. The events included: changes in parental relationships, family experience with job loss, serious accidents or illnesses, and death of a household member over the course of the past year.

Teacher support: Four items assessed a child's perception of teacher support. Items were drawn from the Seattle Social Development Project (Hawkins & Catalano, 1990) and were designed to measure pro-social processes in the classroom (Catalano et al., 2005). The items include: (a) Does your teacher notice when you try hard? (b) Does your teacher tell you when you do well? (c) Does your teacher help you when you need it? (d) Do you like your teacher? Response options were *YES, yes, no, NO. A* mean score was computed across items so that the scale had a range from 1 to 4. Though internal consistency was moderate, alpha reliabilities increased as children grew older (αs = .54, .68, .75, and .78).

Peer acceptance: A three-item scale representing level of peer acceptance was drawn from teacher surveys administered each spring. Items were taken from the Walker T Pref. (Walker & McConnell, 1988) and from the TOCA–R (Werthamer-Larsson et al., 1990). The items include: (a) makes friends easily with other children, (b) plays with classmates, and (c) rejected by classmates (reversed). The number of response options differed across the items; therefore, a scale score was created by first computing a z score for each item and then averaging across the three z scores.

Measures of Individual Characteristics and Cumulative Measures of Stress and Mobility

Gender: Gender data were taken from district records and coded as a dichotomous variable, with 0 = *female* and 1 = *male*.

Initial low income: Initial low-income status was assessed during the first 2 years of the project through parent surveys and was coded as a dichotomous variable with 0 = *not low income* and 1 = *low income*. Families who reported being eligible for free or reduced-price lunch program, Aid to Families with Dependent Children, or food stamps during Year 1 or Year 2 of data collection were coded as having initial low-income status.

Initial antisocial behavior: A five-item scale of antisocial behavior was drawn from teacher surveys administered in the fall when the children were in second or third grade. The scale consists of items taken from the TOCA – R (Werthamer-Larsson et al., 1990) and the Child Behavior Checklist (Achenbach, 1991). Items include: (a) argues a lot, (b) talks back to adults/is disrespectful, (c) lies, (d) stubborn, and (e) yells at others. Response options were: *rarely or never true, sometimes true*, and *often true. A* mean score was computed across items so that the scale had a range from 1 to 3. Correlations across Grades 2 through 5 ranged from .43 to .62 ($p < .001$).

Initial shy/withdrawn behavior: A five-item scale of shy/withdrawn behavior was drawn from teacher surveys administered in the fall when the children were in second or third grade. The scale consists of items taken from the TOCA – R (Werthamer-Larsson et al., 1990) and the Child Behavior Checklist (Achenbach, 1991). Items include: (a) shy or timid; (b) withdrawn, does not get involved with others; (c) avoids classmates; (d) likes to be alone; and (e) secretive, keeps things to self. Response options were: *rarely or never true, sometimes true*, and *often true. A* mean score was computed across items so that the scale had a range from 1 to 3. Correlations across Grades 2 through 5 ranged from .27 to .43 ($p < .001$).

Total school changes: A cumulative index of school changes was calculated by summing the total number of school changes a child experienced during the 4 study years. This measure included multiple school changes that some subjects made within one school year: Thirty-one students moved twice in 1 year and 2 students moved three times in 1 year. The most mobile students in the study experienced five school changes; thus, the variable ranged from 0 to 5.

Total family stress: A cumulative index of family stress was calculated by summing children's yearly experiences with family stress. Because four items were assessed during each of the 4 study years, students could have experienced a maximum of 16 stressors. The actual range for this sample was 0–13.

Analysis

Growth curve analyses were conducted using hierarchical linear modeling (HLM) 5.0 (Raudenbush, Bryk, Cheong, & Congdon, 2000). In the growth curve analysis framework, individual change is represented through a two-level hierarchical model in which the repeated measurements at Level 1 (e.g., yearly values on the outcome measures or covariates) are nested within individuals at Level 2 (e.g., person-level predictors such as gender and low-income status). In addition to the intercept and linear change parameters in the general Level 1 model, the time-varying covariates (yearly experiences with school transfers, teacher support, peer acceptance, and family stress) were specified at Level 1. Child characteristics (gender, initial low-income status, and initial antisocial and shy/withdrawn behavior) and cumulative variables (total number of school transfers and total number of family stressors) were included in the Level 2 equations.

Selecting the "center point" for time is a critical decision in the HLM process because it determines how one will interpret individual coefficients. Time in this study was coded (−3, −2, −1, 0) so that the interpretation of the intercept was at the last time point when the children were in fifth grade. The intercept was defined as the outcome at fifth grade because we were interested in examining specifically if school changes and other life circumstances altered the level of outcomes by the last time point in the study. Additionally, setting the intercept at the last time point ensured temporal ordering between the intercept and the cumulative school change and cumulative family stress variables.

Results

Analysis of the data proceeded in four phases. The first phase involved examining correlational data to consider the relationships among the variables prior to modeling growth in the outcome variables. In the next three phases of analyses, HLM models were built using a "step-up" strategy, starting by testing simple relationships and moving to more complex models with multiple variables (Raudenbush & Bryk, 2002). We selected a step-up strategy

because in our initial analyses we tested models with all Level 1 and Level 2 predictors simultaneously and found that we did not have enough power to test these complex models.

Phase 1: Correlations

The matrix of correlations for child characteristics and across-time averages of each of the time-varying covariates and outcomes is provided in Table 2. Among the findings, the total number of school changes was positively associated with being low income at the beginning of the study and with receiving a higher teacher rating of antisocial behavior in the early years of data collection. School changes were also positively associated with the total number of stressful life events a child experienced during the study period. Finally, in terms of its relationship with the outcome measures, total school changes were correlated with academic performance and classroom participation but not with positive attitude toward school.

Another noteworthy finding was that, contrary to our hypothesis, teacher support was not correlated significantly with academic performance. Finally, across-time peer acceptance was found to be highly correlated with across-time classroom participation ($r = .67$, $p < .001$). Both of the measures were based on teacher ratings, and there was a concern that they were measuring the same construct. Therefore, peer acceptance was excluded in the models examining classroom participation and results do not appear in subsequent tables.

Phase 2: Fitting the Level 1 Models

A series of models for each of the three outcome variables examined the intercept (grand mean at fifth grade), the linear change (rate of growth), and slopes for each of the four time-varying predictors. Results of this phase of the analysis are shown in Table 3. First, an unconditional model containing the intercept and the linear change slope was estimated for each outcome (Table 3, column 1). The model provides a baseline measure of the intercept and average rate of growth on each outcome. Results indicate that each of the three outcomes was characterized by significant negative linear change.

Next, the four time-varying predictors (yearly measures of school change, experience with family stress, teacher support, and peer acceptance) were added to the unconditional growth models one at a time to estimate the effects of children's exposure to these stressful and supportive conditions (Table 3, columns 2–5). The only exception, as mentioned earlier, was that the model testing the influence of peer acceptance on classroom participation was excluded due to high correlations. Each time-varying predictor was centered in a theoretically meaningful way to aid in the interpretation of the results. First, for yearly transfers and yearly stress, 0 represented the absence of a transfer or no experience with any of the four stressful family events. Second, the teacher support and peer acceptance predictors were "group-mean centered." Group, in this context, refers to the group of scores available for each child, and thus, within the analysis, the impact of teacher support and peer acceptance is in relationship to a student's own experiences over time not to that of his or her peers. Our choice to use group-mean centering stemmed from a concern that students who typically receive more support are the ones who do better in school. The correlation between across-time teacher support and across-time classroom participation ($r = .15$, $p < .001$) and positive attitude toward school ($r = .55$, $p < .001$) supports this relationship.

Results for the time-varying predictors indicate that peer acceptance and teacher support were significant and positively related to the prediction for two of the three tested outcomes (Table 3, columns 2 – 5). In addition, yearly transfers were significantly and negatively related to teacher ratings of academic performance. A child's yearly experience with stress was not a significant predictor for the growth trajectories of any of the three outcomes. Only

the significant time-varying predictors were selected to move into the next phases of the model-building process.

A final step in this phase of the analysis involved testing cross-level interactions between the Level 2 child predictors and the slopes for time and each of the significant time-varying covariates. This step was undertaken to determine whether certain characteristics of the child were related to accelerations or decelerations in linear growth. To test these relationships, all Level 2 child predictors were tested on the slope of time and on the significant covariates for each outcome. Three significant or nearly significant cross-level interactions emerged from these tests and were included in subsequent tests to determine if they retained significance in the more complex models. These results are not shown in the tables. First, in the model testing the effect of teacher support on positive attitude toward school, the total number of school changes was significantly related to teacher support (coefficient = .055, *SE* = .022), $t(986) = 1.97$, $p < .021$. Second, for academic performance, two predictors approached significance: The total number of school changes slowed the growth of academic performance over time (coefficient = −.027, *SE* = .013), $t(986) = -2.34$, $p < .051$, and initial antisocial behavior predicted a reduction in the effect of peer acceptance on academic performance (coefficient = − .092, *SE* = .046), $t = -2.08$, $p < .056$.

Phase 3: Adding Level 2 Predictors and Significant Level 1 Covariates

This phase of analysis answered the first two research questions proposed for this study. The results are summarized for each outcome separately in Tables 4–6. The first question was, “Do experiences with elementary school mobility, measured cumulatively, diminish attitudes toward school and reduce the development of classroom participation and academic performance?” To answer this question, the total number of school changes a child made over 4 years was added to the intercept and linear change parameters within the unconditional growth model (Tables 4–6, column 1). Total school changes had a significant negative impact on fifth-grade classroom participation scores, $t(986) = -4.24$, $p < .001$, and scores for academic performance, $t(986) = -4.18$, $p < .001$, but was not significant for a child’s positive attitude toward school. This is noteworthy because the experience of transferring schools was conceived as a risk factor, which might erode children’s positive attitudes about school. These findings do not support this hypothesis. In terms of linear change, the total number of school transfers a child made significantly impacted the linear change over time for only one outcome: academic performance, $t(987) = -2.10$, $p < .05$. Because the number of transfers was significant in this step, it was retained as a predictor of the slope in subsequent models for academic performance. It was not retained as a predictor on the time slopes of the other two adjustment outcomes.

The second research question proposed in this study was, “Do risk factors, including gender, low-income status, antisocial and shy/withdrawn behavior, and overall family stress, play a role in explaining the relationship between mobility and school outcomes?” To answer this question, the remaining Level 2 child characteristics were included in the model on the intercept (Tables 4–6, column 2). Results indicate that when the other five predictors are included in the models, the student mobility variable continues to have a significant negative effect on the intercept of classroom participation at fifth grade, $t(981) = -2.02$, $p < .05$, but not on academic performance. However, total transfers continue to significantly slow the linear growth of academic performance, $t(986) = -2.11$, $p < .05$.

Within these models, other child-level predictors did emerge as significant in predicting scores for the intercept at fifth grade. Initial antisocial behavior and low-income status contributed significantly to the intercepts of all three outcomes. Being male predicted declines in positive attitude toward school and classroom participation and having shy/withdrawn behavior predicted declines in classroom participation and academic

performance. Finally, the total number of stressful family events a child experienced predicted declines in classroom participation.

Phase 4: Testing the Final Models

In the final stage of the analysis, each significant Level 1 covariate was entered one at a time to answer the third research question: "Do yearly measures of school change, family stress, peer acceptance, and teacher support impact the development of social and academic outcomes, taking into account other risk factors?" Results of final models for each of the three outcomes are presented in Tables 4–6.

Classroom Participation

As shown in Table 4, column 3, teacher support had a positive and significant influence in the model, $t(981) = 5.65$, $p < .001$. Specifically, in years when children reported higher than average levels of teacher support, compared to their own scores across time, their classroom participation scores were estimated to improve. The total number of school changes retained significance, $t(981) = -2.03$, $p < .05$, even with the other five Level 2 predictors included in the model. Gender, initial antisocial behavior, and initial low-income status emerged as unique predictors of declines in children's classroom participation scores.

Positive Attitude Toward School

In the model testing the time-varying influence of teacher support (Table 5, column 3), teacher support was predictive of the growth trajectories for children's positive attitudes toward school, $t(986) = 22.13$, $p < .001$. In this model, gender and initial antisocial behavior were still significant predictors of positive attitude toward school, but low income was no longer a significant predictor.

The cross-level interaction between teacher support and the total number of school changes was also included in the analysis of attitude toward school (Table 5, column 3). Results indicate that the number of school changes a child experienced increased the strength of the relationship between teacher support and attitude toward school. In other words, teacher support is, in general, related to children's positive attitude toward school but is particularly important for those children who experience school changes.

The model including peer acceptance (Table 5, column 4) predicts a positive change in the growth trajectories for positive attitude toward school, $t(987) = 3.45$, $p < .001$. Of the child-level variables entered in the model, gender, initial antisocial behavior, and low-income status were significant predictors of fifth-grade positive attitude toward school.

Academic Performance

In the analysis of academic performance, results indicate that peer acceptance (Table 6, column 3) made a significant positive contribution, $t(986) = 10.23$, $p < .001$. In this model, three Level 2 predictors were statistically significant at $p < .001$ for academic outcomes at fifth grade: initial low-income status, antisocial behavior, and shy/withdrawn behavior.

Within the peer acceptance model, two cross-level interactions were significant. The interaction between peer acceptance and initial antisocial behavior was significant, $t(986) = -2.08$, $p < .05$, indicating that antisocial behavior decreases the effect of peer acceptance on academic performance. Additionally, the variable for total number of transfers, included on the time slope, was also significant, $t(986) = -2.34$, $p < .05$, indicating that the linear growth of academic performance was slowed by school transfers.

A second model, estimating the influence of yearly school changes on academic performance, was tested in a similar fashion (Table 6, column 4). In this model, yearly school changes predicted declines in the growth of academic performance, $t(987) = -3.02$, $p < .01$. Of the Level 2 child characteristics, three were significant at $p < .001$: initial low-income status, antisocial behavior, and shy/withdrawn behavior. Total number of transfers no longer predicted a change in the linear growth of academic performance.

Discussion

Research on mobility in schools has, until now, been limited by an inability to capture the complex conditions in which children make school changes. In this study, the application of growth curve analyses within a developmental science research framework allowed for the examination of school transfer effects within the context of other characteristics that may put children at risk for poor adjustment. Specifically, by including risk factors such as antisocial behavior, low-income status, and family stress, growth curve modeling enabled us to examine the unique effect of mobility. The analytic tools also allowed for the inclusion of temporal changes in students' transfer experiences and personal circumstances, opening up a dynamic view of mobility and related phenomenon. In this section, we highlight results for student mobility measures (both yearly and cumulative) and each of the time-varying predictors before proceeding with a discussion of limitations and implications.

Cumulative and Yearly Student Mobility Effects

The findings indicate that changing schools during the elementary school years predicts declines in classroom participation and academic performance, even when other potentially confounding predictors are included in the models. Results also show that the effect of changing schools operates a bit differently for each of these outcomes. For classroom participation, the total number of transfers a child made across the 4 years predicted lower levels of classroom participation at fifth grade. Changing schools does not, however, appear to have an immediate or year-to-year impact on classroom participation. These results are consistent with a number of mobility studies that showed that a single move may not impact children, but when moves accrue, their cumulative impact can be highly significant (Kerbow, 1996; Simpson & Fowler, 1994; Tucker et al., 1998; Wood et al., 1993). The findings for classroom participation are noteworthy, as research reporting a cumulative effect of mobility has focused on measures of academic achievement and behavior problems.

The effect of school transfers is robust and remains significant when other factors associated with school transfers are included in the equation. These factors— initial antisocial behavior, being male, initial low-income status, initial shy/withdrawn behavior, and total family stress—were also significant and appear to be strong predictors of classroom participation. Thus, the findings show that making a school change is only one of the significant factors that have a negative influence on the development of classroom participation.

The findings indicate that changing schools appears to have a different type of influence on the second significant outcome, academic performance, than it does on classroom participation. Annual and not cumulative mobility appears to affect teacher ratings of academic performance. During each school year, if a child changed schools at least once, the move or moves forecasted a decrease from the sample average slope for teacher-rated academic performance in the spring survey. Because we used a dichotomous measure, these results do not account for the multiple moves that 33 of the subjects made in a school year. We plan to examine the impact of these multiple moves in a future study.

The academic results reported here add evidence to the existing empirical literature on the association between annual school mobility and declines in academic achievement (Kerbow, 1996; Tucker et al., 1998). We were aware that a possible confounding variable might be that the children who move most often are simply the ones who would ordinarily show a decline in performance over time. However, in the final model run with the yearly transfer covariate, the total number of transfers was included on the slope. Thus, the effect was significant even when accounting for the performance of frequent movers.

We found no evidence that school changes, either the total number of transfers or the year-to-year measure of transfers, affected the growth trajectories of children's positive attitude toward school. This may be because school remains a positive influence for those who move, especially those who move often and experience other family stressors (Hetherington, 1979). The total number of transfers did play a minor but significant role in estimating the impact of teacher support on children's positive attitude toward school. Specifically, in the years that children in the sample felt significantly more teacher support than their average, their attitude scores were predicted to increase. In addition, this relationship between teacher support and attitude was stronger for children who moved more frequently. In other words, results suggest that the degree of teacher support is more important for the children who experience a school change. These findings are congruent with the research of DuBois et al. (1994), who found that young adolescents who experienced multiple economic disadvantages appeared to benefit more from social support received from adults in the school than do their "low-risk" peers.

Family Stress, Peer Acceptance, and Teacher Support Effects

In addition to examining the effects of student mobility, we considered alternative explanations for declines and increases in children's growth on the three outcomes. To this end, time-varying risk (yearly family stress) and protective factors (yearly measures of teacher support and peer acceptance) were added to hierarchical models to examine the relative explanatory strength of these factors. Of particular interest was the influence of family stress experiences because prior researchers have warned of a confounding effect of stress on school transfers. Contrary to expectations, a child's yearly experiences with family stress did not have a significant effect on any of the school engagement outcomes measured in this study.

One would expect that a child's exposure to the stress generated by divorce, job loss, or family death might result in at least temporary declines in school adjustment (DuBois et al., 1994). However, as the work of Hetherington (1979) shows, there is wide variability in the responses of children to divorce based on such factors as age, temperament, and changes in economic status. Further, not all family losses lead to greater conflict or strife within the family unit. In some cases, a parental breakup or death in the family may offer relief for children who have been living in a state of conflict or worry. Finally, a recent study by Gershoff, Aber, Raver, and Lennon (2007) suggests a much more complex relationship between family stress, low-income status, and child outcomes than the one examined in this study. Their work revealed that material hardship (i.e., months of financial troubles, food insecurity, inadequacy of medical care, residential instability) had a stronger association with family stress than income level. To more accurately assess the effect of stress, future studies of mobility should take into account these more nuanced measures of family stress and hardship.

In contrast to yearly family stress, the findings for both yearly protective factors were significant, providing evidence that social ties present in the school environment, or what some might call school social capital, serve to support successful outcomes. The findings lend support to the theory of appropriation (Vygotsky, 1962, 1978), which emphasizes that a

child's adaptation to a learning environment is achieved by social means, through the people surrounding the child at school. First, yearly measures of a child's peer acceptance emerged as significant for both academic and attitudinal outcomes. In a given year, if peer acceptance was rated significantly above the child's average, his or her academic performance scores increased. One possible bias for this finding is that teacher ratings of academic performance at this age may be more a measure of how well children are getting along in class rather than a measure of achievement in math or reading. These findings should be interpreted with caution given the moderate correlation between teacher-rated peer acceptance and teacher-rated academic performance (r = .36). However, if replicated in future studies using other measures of academic growth, this finding would lend support to those who postulate that positive social interactions in the classroom facilitate intellectual development (Ladd et al., 1999).

Second, in the model testing the influence of peer acceptance on attitude toward school, positive attitudes were estimated to improve when children experienced above-average peer acceptance, though, when comparing their influence, teacher support appears to overshadow peer acceptance. These findings are consistent with developmental research showing that at this age, prior to the shift in adolescent social priorities toward peer relationships, teacher relationships are critical in terms of children's feelings about school (Birch & Ladd, 1997; Howes & Hamilton, 1993). One limitation of this study is that we did not collect data on children prior to their entry into school, during kindergarten, or during the transition to first grade. Research findings suggest that early school experiences, particularly relationships with teachers and peers, may have lasting effects on children (Birch & Ladd, 1997; Ladd et al., 1999; Pianta, Steinberg, & Rollins, 1995).

Results for the other protective factor indicate that children's perceptions of teacher support had a positive influence on the growth trajectories for children's classroom participation and positive attitudes toward school. Specifically, in a given year, when children indicated that they felt supported by their teachers significantly above their average, their classroom participation improved. In the same way, scores for positive attitude toward school improved during years when children reported more support, and, as mentioned earlier, mobile children received an additional boost in their positive feelings about school when they felt supported by teachers. The results here are not surprising given that the items we used to measure teacher support reflect a child's perspective on the condition of the relationship, emphasizing the level of helpfulness and caring present in the relationship (e.g., Does your teacher notice when you try hard? Do you like your teacher?). Prior research has established that children respond with improved attitudes and better behavior when they have closer relationships with their teacher (Birch & Ladd, 1997; Valenzuela, 1999; Wentzel, 1997). Contrary to expectation, the child's view of teacher support did not appear to impact teacher ratings of academic performance. Given that other researchers have found that warm and caring relationships with students influence academic outcomes, these results come as a surprise.

Implications for Practice in the Schools

Researchers have indicated that schools play a critical role in mitigating the negative effects of mobility on student outcomes and suggest that school personnel should be doing more to support students, given the high level of risk associated with school transfers (Mantzicopoulos & Knutson, 2000; Nelson et al., 1996; Vernberg, 1990). Unfortunately, a common concern raised by researchers is that few teachers have prior training in working with transfer students (Adelman & Taylor, 1991; Kerbow, 1996; Lash & Kirkpatrick, 1990). For example, Lash and Kirkpatrick (1990) found that teachers are trained to develop their instructional plans based on a classroom of students who will remain with them for an entire

school cycle rather than assessing and teaching to the needs of students who enter in the middle of the year.

To improve outcomes for mobile students, a variety of practices have been suggested, including: intensive tutoring for high-risk transfers (Jason et al., 1992), careful assessment of social and academic strengths upon entry (Adelman & Taylor, 1991), facilitation of friendship formation and the acceptance of new-comers (Vernberg, 1990), and constructing a sense of stability and predictability in the school setting (Mantzicopoulos & Knutson, 2000). The intervention studies of high-risk elementary-age transfer students, conducted by Jason and colleagues in Chicago, have undergone the most systematic evaluation. In several controlled studies, transfer students participated in an orientation program and received biweekly tutoring with results indicating that the intervention improved student grades and achievement tests scores over the course of 1 year (Jason et al.; Jason et al., 1989, 1993). Despite including an orientation component, the intervention did not appear to positively influence social or behavioral outcomes for transfer students.

Taken together, the academic findings from the Jason studies and the behavioral and attitudinal findings of the present study hold some promise for practitioners hoping to mitigate the problems some students encounter following a school transfer. Results suggest that effective interventions for transfer students should include at least two components: (a) intensive tutoring to address the academic deficits of many transfer students and (b) university and school-based trainings to raise awareness of hardships encountered by mobile students, to increase caring responses, and to address peer acceptance in the classroom. Indeed, our previous research on school interventions indicates that a combined package of teacher, parent, and student training to support academic achievement and reduce problem behavior has impacted both school commitment and academic performance (Catalano et al., 2003).

Conclusions

One of the aims of this study was to use the developmental science framework (Magnusson & Cairns, 1996) to improve on prior research. This approach allowed us to build on the existing literature in a number of important ways. First, longitudinal data on elementary children have rarely been used in research on school mobility, especially data from studies that retained a large number of subjects. In the present investigation, all the analyses were calculated with a minimum of 94% of the original sample of preadolescent children. Even children who moved four or five times during the study years were retained in the analysis. Second, of the small group of published longitudinal studies on mobility, none have explored the relationship between school changes and classroom participation and positive attitude toward school. The findings presented in this study contribute to the existing research on the relationships between mobility, academic achievement, and behavior problems. Finally, this study demonstrated that growth curve modeling offers a powerful tool in the effort to understand how fluctuating circumstances can make a difference, both positively and negatively, for mobile children. Within the models examined in this study, a specific effort was made to shed light on changing relationships in the school that might protect children from undesirable outcomes associated with school changes.

Although the work presented here represents some key refinements in studying the developmental changes associated with mobility, a number of improvements must still be addressed. For example, within the developmental science framework, researchers are cautioned to be careful about the assumptions we make about stable factors. We chose to use a single measure of two child-level variables, antisocial behavior and low-income status, that emerged as significant predictors in most of the final models. Given their significance, future research that treats income status and antisocial behavior as time-varying factors

might find that fluctuations in these variables significantly influence child outcomes. For example, a mobile child with a history of behavior problems could be influenced by a supportive teacher to make changes in classroom behavior leading to significant improvements in attitude or participation.

In outlining the developmental science framework, Magnusson and Cairns (1996) urge researchers to recognize the complexity of development and yet they acknowledge that "decisions must be made to bring some features to the foreground and move others into the background" (p. 8) in a given research project. In the present study, we used a predominantly Caucasian, suburban sample and chose to focus on protective relationships that might influence students in individual school settings. Clearly, these choices limit our ability to generalize to urban, more diverse, and more mobile populations. There is evidence in the literature that school-level effects, such as the pace of instruction and school climate, in urban schools with highly transient populations ought to be included in a longitudinal analysis of mobility (Alexander et al., 1996; Kerbow, 1996; Rumberger & Larson, 1998). Our choices also limited our ability to examine extrafamilial or neighborhood factors, including relationships with coaches, pastors, or caring neighbors who may support children new to neighborhoods and help them engage with school. Further, we did not examine the more traditional measures of social capital, including indicators of parent-community ties that may serve to support mobile students (Hagan et al., 1996; Pribesh & Downey, 1999).

In light of the limitations and strengths of this study, a promising direction for future research is to explore, using growth curve modeling, the changing family circumstances which may influence children's experience of moving. A study by Macmillan, McMorris, and Kruttschnitt (2004) marks a path in this direction by finding that the lives of young mothers and their children (ages 4–7) are bound together in significant ways. Among other things, the study shows that changes in maternal circumstances (e.g., meaningful escapes from or long-term movement into poverty) influenced children's antisocial behavior. The results are a clear invitation to include time-varying variables within the family context, such as fluctuations in family income and timing of divorce and remarriage, in future examinations of the consequences of mobility for children. Within the developmental science framework, growth curve modeling would allow for an examination of the theory (Lash & Kirkpatrick, 1990) that the reason why a family moves (e.g., upward mobility, forced mobility, lifestyle choice) leads to the great variation in consequences for children.

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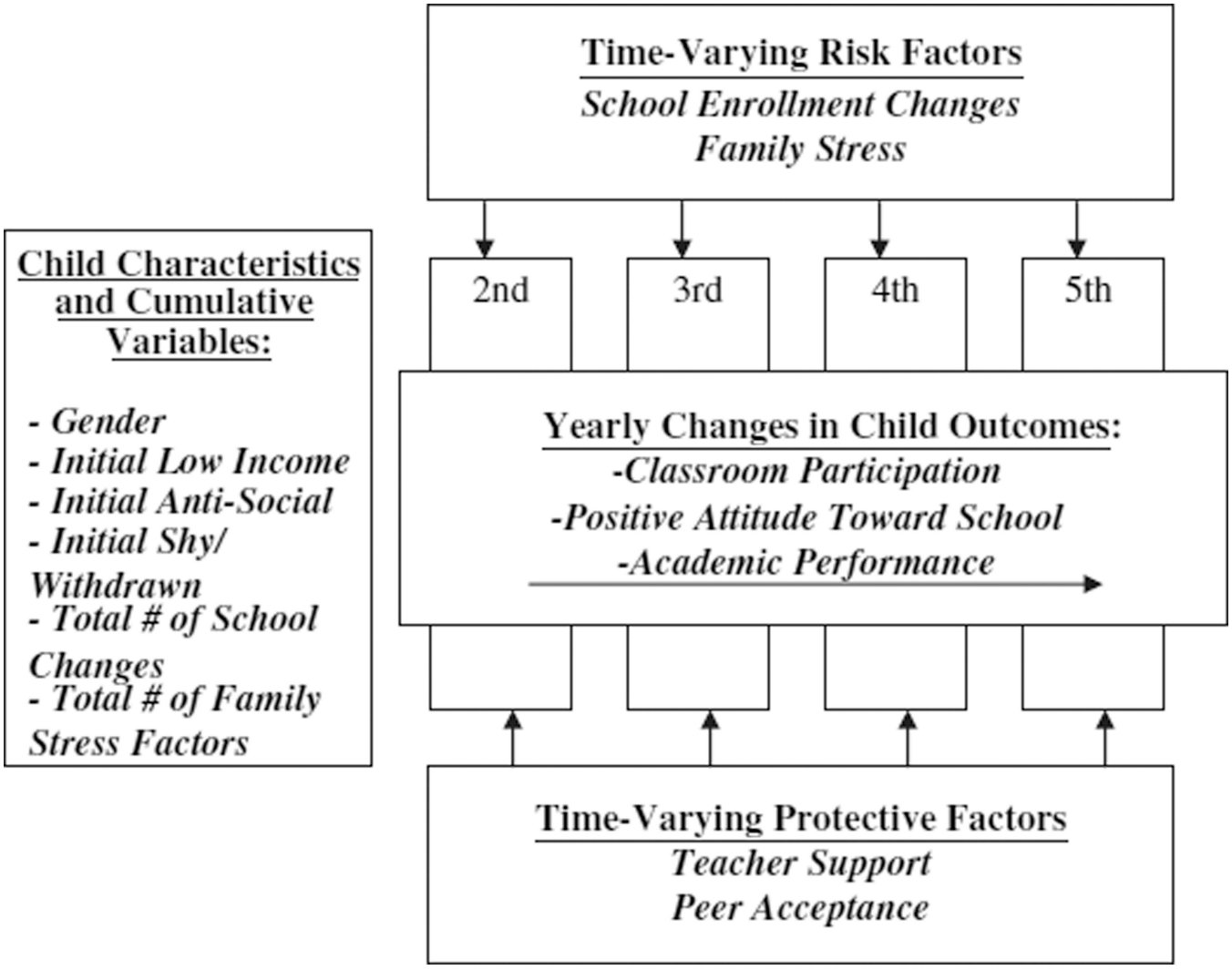

Figure 1.
Model of the relationship between outcomes, time-varying covariates, and child characteristics.

Table 1

Descriptive Statistics for Hierarchical Linear Modeling Analyses

Variable	*M*	*SD*	*N*	α	Data source	Data collection
Time invariant						
Gender	0.53	0.50	1,003		Parent	Year 1 or 2
Low income	0.35	0.48	1,003		Parent	Year 1 or 2
Antisocial	1.24	0.42	1,003	.88	Teacher	Year 2, fall
Shy/withdrawn	1.34	0.40	1,003	.81	Teacher	Year 2, fall
Total school changes	0.74	0.90	1,003		School	Yearly, spring
Total stress	2.14	2.18	1,003		Parent	Yearly, spring
Time varying						
Yearly school change	0.18	0.39	3,917		School	Yearly, spring
Yearly stress	0.58	0.79	3,684		Parent	Yearly, spring
Peer acceptance	0.00	0.85	3,759	.75–.89	Teacher	Yearly, spring
Teacher support	3.46	0.54	3,827	.54–.78	Child	Yearly, spring
Classroom participation	3.80	0.78	3,755	.90–.91	Teacher	Yearly, spring
Attitude toward school	3.15	0.62	3,831	.55–.70	Child	Yearly, spring
Academic performance	3.19	1.23	3,753	.92–.93	Teacher	Yearly, spring

Note. The time-invariant variables were entered at Level 2. The time-varying variables were entered at Level 1.

Table 2

Correlations

	1	2	3	4	5	6	7	8	9	10
1. Total school changes										
2. Gender	.02									
3. Low income	22**	.01								
4. Antisocial	13**	.15**	.14**							
5. Shy/withdrawn	07**	−.02	.11**	.16**						
6. Total stress	17**	.02	.26**	.14**	.05**					
7. Yearly school change	54**	.01	.12**	.07**	.04**	.08**				
8. Yearly stress	13**	.01	.20**	.11**	.03*	.71**	.07**			
9. Peer acceptance	−.12**	−.10**	−.17**	−.34**	−.26**	−.14**	−.08**	−.11**		
10. Teacher support	.04**	−.01	.04**	−.09**	.00	−.01	.03	.02	.08**	
11. Classroom participation	−.13**	−.22**	−.18**	−.42**	−.14**	−.15**	−.08**	−.12**	.67**	.15**
12. Attitude toward school	.01	−.09**	−.02	−.16**	−.01	−.03	.00	−.01	.22**	.55**
13. Academic performance	−.10**	−.06**	−.25**	−.17**	−.13**	−.11**	−.08**	−.09**	.36**	.01

Note. Correlational data for the time-varying measures, including yearly school change, yearly stress, peer acceptance, teacher support, classroom participation, attitude toward school, and academic performance represent across-time averages.

* Pearson *r* correlation is significant at the .05 level.

** Pearson *r* correlation is significant at the .01 level.

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Table 3

Comparing Alternative Level 1 Models

	Unconditional		Unconditional with yearly school change		Unconditional with yearly stress		Unconditional with peer acceptance		Unconditional with teacher support	
	Coefficient	***SE***	**Coefficient**	***SE***	**Coefficient**	***SE***	**Coefficient**	***SE***	**Coefficient**	***SE***
Classroom participation										
Intercept at Grade 5	3.736***	.025	3.737***	.025	3.735***	.025			3.736***	.025
Linear change	−0.038***	.009	−0.038***	.009	−0.039***	.009			−0.038***	.009
Covariates										
Yearly school change			−0.026	.028						
Yearly stress					−0.011	.017				
Peer acceptance										
Teacher support									0.117***	.021
Positive attitude										
Intercept at Grade 5	3.099***	.200	3.098***	.200	3.101***	.019	3.099***	.200	3.098***	.018
Linear change	−0.032***	.009	−0.033***	.009	−0.031***	.009	−0.032***	.009	−0.032***	.007
Covariates										
Yearly school change			.015	.027						
Yearly stress					0.019	.017				
Peer acceptance							0.064***	.018		
Teacher support									0.578***	.019
Academic performance										
Intercept at Grade 5	3.113***	.039	3.120***	.039	3.112***	.039	3.117***	.039	3.113***	.039
Linear change	−0.046***	.011	−0.042***	.011	−0.046***	.011	−0.043***	.011	−0.046***	.011
Covariates										
Yearly school change			−0.146***	.037						
Yearly stress					−0.008	.021				
Peer acceptance							0 222***	.022		
Teacher support									0.048	.028

*** $p < .001$.

Table 4

Classroom Participation —Adding Level 2 Predictors and Significant Level 1 Covariates

	Unconditional plus total school changes		Unconditional plus all Level 2 predictors		Final model with teacher support	
	Coefficient	***SE***	**Coefficient**	***SE***	**Coefficient**	***SE***
Intercept at Grade 5	3.819***	.032	4.018***	.035	4.017***	.035
Total school changes	−0.115***	.027	−0.042*	.021	−0.042*	.020
Gender			−0.274***	.033	−0 277***	.033
Low income			−0.157***	.037	−0.153***	.037
Antisocial			−0.679***	.044	−0.683***	.045
Shy/withdrawn			−0.133**	.049	−0.129**	.049
Total stress			−0.022**	.008	−0.022**	.009
Linear change	−0.039***	.012	−0.038***	.009	−0.037***	.009
Total school changes	0.001	.011				
Covariate: Teacher support					0.118***	.020

*$p < .05$.

**$p < .01$.

***$p < .001$.

Table 5

Positive Attitude Toward School—Adding Level 2 Predictors and Significant Level 1 Covariates

	Unconditional plus total school changes		Unconditional plus all Level 2 predictors		Final model with teacher support		Final model with peer acceptance	
	Coefficient	***SE***	**Coefficient**	***SE***	**Coefficient**	***SE***	**Coefficient**	***SE***
Intercept at Grade 5	3.086***	.025	3.134***	.030	3.132***	.029	3.135***	.030
Total school changes	0.020	.022	0.005	.015	0.003	.015	0.005	.015
Gender			−0.081**	.027	−0.082**	.027	−0.082**	.027
Low income			0.058*	.029	0.055	.029	0.058*	.029
Antisocial			−0.236***	.038	−0 227***	.038	−0.235***	.038
Shy/withdrawn			0.016	.035	0.015	.035	0.016	.035
Total stress			−0.007	.006	−0.006	.006	−0.007	.006
Linear change	−0.043***	.012	−0.032***	.009	−0.033***	.007	−0.032***	.009
Total school changes	0.016	.011						
Covariate: Teacher support					0.543***	.025		
Covariate: Total school changes					0.045*	.023		
Covariate: Peer acceptance							0.063***	.018

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 6

Academic Performance—Adding Level 2 Predictors and Significant Level 1 Covariates

	Unconditional plus total school changes		Unconditional plus all Level 2 predictors		Final model with peer acceptance		Final model with yearly school change	
	Coefficient	***SE***	**Coefficient**	***SE***	**Coefficient**	***SE***	**Coefficient**	***SE***
Intercept at Grade 5	3.244***	.051	3.464***	.068	3.470***	.068	3.463***	.068
Total school changes	−0.184***	.044	−0.081	.021	−0.086	.044	−0.046	.045
Gender			−0.111	.033	−0.110	.066	−0.109	.066
Low income			−0.549***	.037	−0.551***	.073	−0.552***	.073
Antisocial			−0.308***	.044	−0.306***	.083	−0.309***	.084
Shy/withdrawn			−0.290***	.049	−0.290***	.083	−0.287***	.083
Total stress			−0.018	.008	−0.019	.016	−0.019	.016
Linear change	−0.027*	.014	−0.027	.014	−0.022	.013	−0.026	.014
Total school changes	−0.028*	.013	−0.028*	.013	−0.031*	.013	−0.022	.013
Covariate: Peer acceptance					0.230***	.020		
Covariate: Antisocial					−0.099*	.047		
Covariate: Yearly school change							−0.115***	.038

* $p < .05$.

*** $p < .001$.