Disentangling Independent and Joint Associations of Residential and school Mobility with Adolescent Development

Sara Anderson
Georgetown University

Tama Leventhal
Tufts University

DO NOT CITE OR DISTRIBUTE WITHOUT AUTHOR PERMISSION

Sara Anderson
Postdoctoral Fellow
McCourt School of Public Policy
Georgetown University
Washington, DC 20057
Sga42@georgetown.edu
Numerous children and adolescents across the U.S. change schools and move homes. Approximately 10-17% of children and adolescents move each year (U.S. Census Bureau, 2013), with young children moving at the highest rates. Precise figures for school mobility are more challenging to estimate, and there is considerable variation by rural/urban/suburban setting (Rumberger, 2003). Moreover, some children will experience both a residential and a school transition. Changing schools or residences may have profound consequences for children’s development that could be compounded by a change in both school and home (Institutes of Medicine, 2008). Residential and school mobility have independent links with adolescents’ achievement and socioemotional development (Fowler, Henry, Schoeny, Taylor, & Chavira, 2013; Herbers, Reynolds, & Chen, 2013; Rumberger, 2003), but far less is known about their joint relationship with adolescent functioning. It is also unclear if when a change in school or residence occurs matters though several studies suggest that early childhood or adolescence as particularly sensitive periods (e.g., Fowler et al., 2013; Ziol-Guest & McKenna, 2013). Knowing which types of transition when they occur could enable more targeted services or interventions for transitioning youth.

Accordingly, this paper examined associations among school, residential, joint (residential and school within one period), and serial (moving consistently across developmental periods) mobility with adolescents’ achievement and socioemotional development. We also sought to understand whether youth are more sensitive to moving (and which type) within a particular developmental period, notably early childhood, middle childhood, and adolescence.

**Theoretical Approach**

We take a life course and bioecological approach to this work (Bronfenbrenner, 1979; Elder & Shanahan, 2006). Residential and school mobility are experienced at a specific time (or
times) in a child’s life (Elder & Shanahan, 2006). Developmental periods encompass at least one major transition in a child’s life, such as school entrance or exit, biological maturation, role shifts, and possibly cognitive alterations (Graber & Brooks-Gunn, 1996). Developmental challenges during these periods are relatively universal and require new modes of adaptation. Thus, we may expect that school and/or residential mobility will confer differential effects on child development depending on when mobility occurs. The timing of mobility during childhood is perhaps as critical as the transition itself because of the changing developmental demands, institutional exposures, and salient relationships across the life course that may differentially inhibit or support behavior before versus after a move. Finally, children are nested in other relevant developmental contexts that may shape how they experience mobility (Bronfenbrenner & Morris, 2006). For example, residentially mobile families may experience additional challenges concurrent to a move due to related issues such as a change in marital status. Similarly, youth may change schools in search of a better quality school or because of bullying.

Our theoretical framework for investigating residential and school mobility does not mean that both types of transitions would confer similar experiences and developmental consequences. Given schools are the province of education, it is most likely that youth who change schools would experience changes, most likely deficits, in their achievement. In addition, it is possible that residential moves would impart more risks to socioemotional development because of the broader upheaval of a move, as empirical research suggests (e.g., Anderson, Leventhal, Newman, & Dupéré, 2014; Coley, Leventhal, Lynch, & Kull, 2013; Fowler et al., 2013). Finally, mobility in more than one context (like school and home) may be indicative of cumulative stressors, but whether an additional contextual shift further erodes functioning is

**Timing and mobility.** Developmental theory suggests that residential and school mobility should be studied in terms of developmental periods. Accordingly, we examine residential and school mobility within and across three developmental periods, early childhood, middle childhood (or elementary school), and adolescence (or middle school), because of the unique transitions, contextual exposures, linked lives, and demands of each period, and the potential for distinct impacts of moving during each period (Elder, 1998). To elucidate the potentially dynamic relationship between residential and school mobility and child and adolescent development, a brief review of the potential relationships for each period are provided in turn. During early childhood, children experience rapid physical, cognitive, and socioemotional development and rely on parents (Shonkoff & Phillips, 2000). Early childhood is also thought to be a period particularly sensitive to environmental exposures, at least in part due to these rapid changes (Shonkoff, 2010). In middle childhood, children transition to elementary school and middle school, continue to develop cognitively, physically, and socioemotionally, and gain independence. These changes suggest a growing relevance of extrafamilial contexts in middle childhood as compared with early childhood (Eccles, 1999; Sameroff & Haith, 1996). Adolescents develop close peer groups and critical thinking skills, experience puberty, and have exposure to diverse contexts outside the home. It is also a period when participation in risk taking behaviors becomes normative (Steinberg & Morris, 2001). Given the considerable shifts and differences across developmental periods, it is reasonable to expect residential and school mobility would have different associations with youth outcomes across periods.

**Residential and school mobility**
A considerable body of research examines residential and school mobility. Fewer studies have sought to understand the intersection of joint instability. It is likely, however, that when children experience a residential and school change, which suggests a considerable shift in terms of geography, that these youth would demonstrate more unfavorable outcomes than similar youth who experience one or the other or neither. For example, the experience of instability and chaos is associated with children’s compromised functioning (Cavanagh & Huston, 2006; Coley, Lynch, & Kull, 2015; Evans, Li, & Whipple, 2013). Moreover, residential and school mobility separately may have distinct avenues of influence.

We first review the evidence linking school mobility to adolescent development. Research based on diverse samples consistently finds that children who experience elementary school mobility have lower achievement and to a lesser extent socioemotional functioning than their stable peers (Alexander, Entwisle, & Dauber, 1996; Gruman, Harachi, Abbott, Catalano, & Fleming, 2008; Hutchings et al., 2013). Middle school moves generally have adverse consequences across several domains of child functioning, although the research primarily focuses on achievement. Several studies use data from the Chicago Longitudinal Study, which followed low-income, minority children who attended Chicago Public Schools pre-k or kindergarten programs starting in 1983. All studies demonstrate consistent, unfavorable links between school changes (vs. no changes) and children’s achievement and educational attainment (Ou & Reynolds, 2008; Temple & Reynolds, 1999). For instance, more frequent school mobility, particularly during middle school, was associated with the worst outcomes in areas such as on-time graduation, levels of occupational prestige, depressive symptoms, and arrests by age 20 (Herbers et al., 2013). Finally, a study based on nationally representative data from the National Longitudinal Study of Youth and using propensity score matching found that students
who changed high schools had a higher probability of dropping out of high school than their stable peers (Gasper, DeLuca, & Estacion, 2012).

Second, a considerable body of literature points to the potential unfavorable association that residential mobility has with youth functioning, but effect sizes remain small. Several studies reveal that moving in childhood is adversely associated with achievement and socioemotional functioning in both childhood and possibly adolescence. For example, in a sample of Baltimore public school children, mobile children (kindergarten through fifth grade) had lower standardized test scores in fifth grade than their stable peers, but only before accounting for background characteristics and prior performance (Alexander et al., 1996). In a large sample of urban children born to unmarried parents, mobility in early childhood (birth through age 5, the only period examined) was associated with compromised attention problems, internalizing and externalizing behaviors, notably among young children (Ziol-Guest & McKenna, 2013). Several studies using nationally representative data find that residential mobility in adolescence is adversely associated with concurrent achievement and behavior. For example, one using the National Educational Longitudinal Study of 1988 (NELS) found that adolescent residential mobility—and not school mobility—was associated with worse performance in reading and math compared with students who did not move; however, most of this difference was attributed to pre-existing differences between children who moved and those who did not (Pribesh & Downey, 1999). Similar research points to an unfavorable connection between adolescent residential mobility and their socioemotional development. Evidence from the nationally representative National Longitudinal Study of Adolescent Health (Add Health) indicates that adolescents who moved within the past two years (vs. stable adolescents) had fewer friends, were less popular, and more likely to be isolated (Haynie, South, & Bose, 2006;
South & Haynie, 2004). Although many studies examine adolescent residential mobility, few have directly contrasted its role relative with that of school mobility.

**Unique, joint, or serial mobility.** In addition to children changing homes and/or schools, children also move at a specific time. Children may move or change schools one time and never do so again. As reviewed, they also may experience a residential and school change within the same developmental period. They also may move repeatedly across development. We term these transitions unique (residential or school move unique to one period), joint (residential and school move within one period), and serial (residential or school changes across childhood and adolescence) mobility. Very little is known about whether such distinctions matter when considering variations in the developmental consequences of residential and school mobility. Knowing which types of mobility and whether the timing matters for adolescent development could help schools and social service agencies in targeting services to those youth most in need.

**The present study**

No studies, to our knowledge, have systematically examined unique, joint, or serial residential and school mobility. As such, we sought to examine the unique and combined effects of residential and school mobility on adolescents’ achievement and socioemotional functioning. In addition, we consider whether the timing of mobility matters for adolescents’ development. As such, our research questions are as follows:

1. Are residential and school changes uniquely associated with adolescents’ achievement and socioemotional development across early childhood, middle childhood, and adolescence?

2. Are joint residential and school changes associated with adolescents’ achievement and socioemotional development in middle childhood and adolescence?
3. Is serial mobility across all developmental periods associated with adolescents’ socioemotional development and achievement?

Method

Study Design and Sample

We employed data from the National Institute of Child Health and Human Development Study of Early Child Care and Youth Development (NICHD SECCYD, see NICHD Early Child Care Research Network, 2005). Data collection began in 1991 in ten sites across the U.S. (Little Rock, AR; Irvine, CA; Lawrence, KS; Boston, MA; Philadelphia, PA; Pittsburgh, PA; Charlottesville, VA; Morganton, NC; Seattle, WA; Madison, WI). To be eligible for the study, the mother had to be at least 18 years old, healthy, and conversant in English, and the infant had to be a singleton. Participants were recruited through hospital visits around the time children were born. One month post-recruitment, 1,364 families enrolled in the study, and 1,056 participants remained active through the age 15 assessment, which comprises our final sample. The data collection occurred in the home, laboratory, child care, and school from birth through 15 years old. The sample, although not nationally representative, reflected the diversity of the catchment areas at the time of recruitment, and included 18% racial/ethnic-minority children, 10% low-education mothers (less than a high school), and 21% single parents.

To mitigate the threat of bias due to missing data, all analyses included 20 imputed datasets, and combined estimates were generated by Stata built-in procedures (mi impute), where coefficients represent an average across imputations and standard errors incorporate the average and the average variability across imputations (Rubin, 1987).

Measures

We used numerous measures in our regression analyses to capture, to the extent possible,
characteristics that would predict residential mobility and adolescent outcomes (Guo & Fraser, 2010). Table 1 provides descriptive statistics for all variables.

**Mobility**

Residential mobility was indexed based on mothers’ annual reported addresses. Addresses were then geocoded and linked to blockgroups, a geographical area of about 500-3,000 residents defined by the U.S. Census Bureau. For all types of mobility, a move constituted a change in blockgroup from one year to the next. School mobility was measured from annual reports of school changes as determined from school records. They included only non-promotional changes. Because school changes were indexed at particular grade, and not age of the child, we index mobility based on grades. In all cases, elementary school mobility coincided with middle childhood and middle school mobility with adolescence. For both residential and school mobility, a dichotomous indicator was used to denote a move as described in detail below (0 = no move; 1 = move).

*Early childhood residential mobility* was conceptualized as at least one move during early childhood (birth through 54 months old; 56%). *Middle childhood residential mobility* was defined as at least one move during middle childhood (54 months through 11 years old; 59%). *Adolescent residential mobility* was defined as at least one move (or school change) during adolescence (approximately 12 to 15 years of age; 27%). The comparison group was youth who did not move in that specific period (though could have moved in other periods).

*Elementary school mobility* was operationalized as at least one school move in kindergarten through fifth grade (25%). Finally, *middle school mobility* was defined as at least one school moved in grades six through nine (9%). In this set of models, the reference category was youth who never changed schools within the prescribed time periods.
The second category of mobility was indexed by developmental period—whether middle childhood (elementary school) or adolescent (middle school) – and include both residential and school mobility (early childhood mobility was excluded because there were no school changes). *Joint middle childhood mobility* was defined as residential and school mobility both occurring in middle childhood (or elementary school) (19%). *Joint adolescent mobility* was conceptualized as residential and school mobility in adolescence (or middle school) (5%). For both indicators, the reference category was youth who did not change both schools and homes (though could have changed one or the other).

*Serial residential mobility* was operationalized as moving at least one time during early childhood, at least one time during middle childhood, and at least one time during adolescence (16%). The referent group was participants who did not move in childhood or adolescence or who moved in one period. *Serial school mobility* was conceptualized as changing schools at least one time in grades k-5 (elementary school) and at least one time in grades 6-9 (middle/junior high school). However, only 3% of the sample experienced both types of mobility, so we omitted this category because it was not an accurate portrayal of youths’ experiences and would pose analytic challenges due to the small sample size.

**Adolescent Outcomes**

**Achievement.** Math and reading achievement were assessed on two occasions, 54 months and 15 years old, by subtests of the Woodcock-Johnson Psycho-Educational Battery-Revised (WJ-R, Woodcock & Johnson, 1989). The 54 month assessment served as a covariate, and the age 15 assessment as the outcome measures. For math achievement, a single subtest, Applied Problems (AP), was used at both assessment periods. For the reading assessment, the Letter-Word Identification was employed at 54 months and the Passage Comprehension (PC) at
age 15. W-scores, a transformation of the Rasch ability scale that center the raw score at 500, were employed.

**Behavioral problems.** Internalizing and externalizing behaviors were measured by standardized subscales of the Child Behavior Checklist (CBCL; Achenbach, 1991a) completed by mothers when children were 54 months old (used as covariate). Children completed the Youth Self Report (YSR; Achenbach, 1991) when they were 15 years old. Parents or children responded to a series of 129 items regarding the behavior/emotional problems of the child within the last six months with three response categories (0 = not true, 1 = somewhat or sometimes true, or 2 = very often or often true). The internalizing scale combines the Withdrawn (e.g., won’t talk), Somatic Complaints (e.g., dizzy), and Anxious/Depressed (e.g., worthless) subscales (α = .89 - .90). The externalizing scales of the CBCL and YSR consist of the Delinquent (e.g., lies or cheats) and Aggressive (e.g., argues a lot) subscales (α = .86 - .92). For both subscales, possible scores ranged from 30 to 100, with higher scores indicating more problems.

**Covariates**

**Child characteristics.** Child characteristics included were gender (1 = male, 0 = female), race (with White as the omitted referent), Hispanic ethnicity (1 = yes, = 0 no), temperament, and study site (9 dummy variables). Child temperament, collected at six months, evaluated aspects of approach, activity, intensity, mood, and adaptability (Carey & McDevitt, 1978).

**Maternal characteristics.** Several maternal characteristics were used in the analyses. Fixed characteristics were captured around the time children were born and include age and education (both in years). Maternal personality was assessed in terms of agreeableness and neuroticism using the NEO personality inventory (Costa & McCrae, 1985), when children were 6 months old. Maternal vocabulary was measured when children were 3 years of age with
standard scores from the Peabody Picture Vocabulary Test – Revised (PPVT-R; Dunn & Dunn, 1981). Marital status change was indexed in childhood and indicated if the mother changed marital status, and was only used in adolescent mobility analyses (1 = change, 0 = no change).

Several additional characteristics about the mother’s parenting and perceived stress were assessed. Maternal depression was measured by the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977), collected when children were one month old ($\alpha = .91$). Social support was assessed when children were one month by the mother ($\alpha = .91$). Maternal sensitivity was measured by videotaped mother-child structured observations when children were six months old (Owen, Klausli, & Murrey, 2000). Observers rated the qualities of the parent-child relationship that address closeness, support of autonomy, and relatedness ($\alpha = .80$ to .85).

**Income.** Income-to-needs was calculated around the time of children’s birth by dividing total household income by the poverty threshold for the respective year for the respective household size. Receipt of public assistance ($1 = yes, 0 = no$) also was measured at.

**Household composition.** Several variables collected around the time of children’s birth, including, the number of people in the household and family structure (single parent or step-family, with two-parents as omitted referent).

**Employment characteristics.** Two characteristics related to the mother’s and father’s (or mother’s partner’s) workforce participation were included in analyses: employment status ($1 = employed, 0 = unemployed$) and school status ($1 = in school, 0 = not in school$), both assessed when children were one month old.

**Neighborhood characteristics.** Neighborhood characteristics were chosen to assess neighborhood socioeconomic disadvantage and residential instability (Leventhal, Dupéré, &
Brooks-Gunn, 2009), two factors likely associated with selection into moving. Families’ addresses were linked to 1990 U.S. Census data when children were one month old at the blockgroup level to characterize the neighborhood environment as described earlier. Variables include the percentage of residents who lived in the neighborhood for at least five years, were unemployed, lived in an urban area, lived under the poverty level, and the neighborhood median family income.

**School characteristics.** We incorporated school characteristics in all models given the important role that schools can play in residential and school mobility (DeLuca & Dayton, 2009). School characteristics included the average percent of students receiving free or reduced price lunch from first through sixth grades based on data from the National Center for Educational Statistics.

**Analytic Strategy**

We employed a series of OLS multiple regression analyses (with comprehensive covariates and 20 multiply imputed datasets as reviewed) to answer our research questions. To address research question 1, we ran three models. In the first (Model 1a), we examined the relationship between early childhood, middle childhood, and adolescent residential mobility with all four adolescent outcomes. In the second (Model 1b), we ran similar models exploring the association between elementary and middle school mobility and adolescent outcomes. Finally (Model 1c), to contrast the unique effects of residential and school mobility, we ran models with both types of mobility for all outcomes.

To address research question 2, joint (residential and school) mobility, we first examined the association between elementary school joint mobility and adolescent outcomes (Model 2a),
then middle school (Model 2b), and finally the unique effects of each in the same model (Model 2c).

Research question 3 investigated the associations between serial residential mobility and adolescent outcomes as serial school mobility was infrequent (Model 3).

**Results**

**Descriptive Analyses**

Table 1 includes the descriptive characteristics of the youth for all covariates and outcomes. There are approximately equal proportions of boys and girls, and the sample is primarily white though minorities are represented. Most mothers had some education beyond a high school degree and levels of depression and vocabulary skills were normative. Most children lived in a two parent home and less than 20% were on public assistance. Around the time of children’s birth, over half of all mothers and almost all fathers were employed. The neighborhoods where children lived had few single mothers and unemployed residents.

**Research Question 1: Unique Mobility**

Results of all multivariate analyses are presented in Table 2. In analyses of residential mobility only (Model 1a), only residential mobility (vs. stability) in adolescence was significantly associated with adolescents’ greater externalizing behaviors and marginally greater internalizing behaviors. School mobility demonstrated a different pattern of results (Model 1b). Youth who changed elementary schools had significantly higher math achievement than their stable peers and marginally higher reading achievement. Youth who changed elementary schools also displayed marginally more internalizing behaviors than stable peers. Middle school mobility had a different pattern of results. Indeed, youth who changed middle schools had lower math and reading scores than stable peers.
Finally, we compared the relative influence of type of mobility for each period (Model 1c). Once accounting for school mobility, adolescent residential mobility was only marginally associated with adolescents’ externalizing behaviors. However, after accounting for residential mobility, the significant associations between elementary and middle school mobility and adolescents’ achievement remained, but the association between middle school mobility and adolescents’ internalizing behaviors was no longer significant.

**Research Question 2: Joint Mobility**

Our second set of analyses sought to determine whether residential and school mobility in the same period was associated with compromised adolescent functioning. Compared with their more stable peers, youth who moved in middle childhood had significantly higher reading scores, marginally higher math scores, and marginally more internalizing behaviors (Model 2a). However, youth who experienced both types of mobility in adolescence, had significantly lower reading achievement and marginally lower math achievement than their more stable peers (Model 2b).

Results differed when holding both types of joint mobility were examined in the same model (Model 2c). The significant associations with reading remained for both types of mobility (though in different directions). In addition, adolescents who experienced changes in both school and residences in middle childhood mobility had more internalizing problems than their more stable peers.

**Research Question 3: Serial Mobility**

---

1 Very similar reading results were found when joint middle school mobile youth were compared with non-movers and non-school changers for that period. Marginal associations were non-significant.

2 In models that compared joint adolescent mobility with non-mobility only, the marginal association was non-significant and the significant association with reading achievement is marginal.
The last research question investigated whether repeated moves across all developmental periods were associated with deficits in functioning. (Serial school mobility was not investigated because of the very low number of youth who changed schools in both elementary and middle school). Results indicated that adolescents’ achievement was not significantly associated with serial mobility; however, it was significantly related to their socioemotional development. Adolescents who moved across all periods had significantly more internalizing and externalizing behaviors than their more stable peers. 3

Discussion

Adolescents experience various patterns of residential and school mobility and such transitions are typically associated with deficits in their functioning. This study considered how school and/or residential mobility, experienced to different degrees and at different times in adolescents’ lives, were associated with their achievement socioemotional development. Results indicate a dynamic relationship with regards to the type, extent, and timing of mobility and adolescents’ development. On the one hand, school mobility was associated with adolescents’ achievement, but the nature of this relationship depended on whether is occurred with or without residential mobility and when it occurred. On the other hand, only repeated residential moves across development had consequences for adolescents’ socioemotional development.

Timing of mobility

Results suggest that when children change schools and homes matters. Perhaps because residential mobility is more common in early childhood and into middle childhood, youth who moved during these periods did not display adverse outcomes. Our results depart from much of the recent literature documenting the deleterious nature of moving for children (Fowler et al.,

3 When comparing serial movers and non-movers, only internalizing behaviors were marginally associated with serial mobility. Results for externalizing behaviors were non-significant.
2013; Ziol-Guest & McKenna, 2013). It is possible, however, that the socioeconomic status of the youth in these studies may explain some of the discrepancies. As discussed, the NICHD SECCYD includes primarily white youth whose parents generally earn more than the average American. Thus, their families may have had resources to support them through such a transition. In contrast, among more disadvantaged families, a residential move could mark concurrent challenges or a response do disadvantageous events such as eviction or relationship status change (Anderson, Leventhal, & Dupéré, 2014; Desmond, 2012).

Results for school mobility presented a very different picture. For youth who changed elementary schools, their achievement benefitted compared with their stable peers; this pattern was reversed in middle school. It is unclear why that would be the case, but a few factors could explain it. Perhaps when children are young, families change schools because they seek a higher quality school for their children or because their children demand a more challenging academic environment. In contrast, during middle school, when the curriculum becomes more prescribed and consistency in material covered becomes more important, a school transition could be more challenging than in elementary school. Indeed, such challenges are recognized as problematic for youth, resulting in several policies to promote school consistency among potentially vulnerable subgroups, including homeless and highly mobile youth, foster youth, and children of military families ("Fostering Connections to Success and Increasing Adoptions Act of 2008," 2008; "McKinney-Vento Homeless Assistance Act of 1987," 1987; The Council of State Governments, 2010). Perhaps youth face challenges in the school because of the potential for concurrent socioemotional deficits, such as problem behaviors, as our results suggest and due to the close connection between domains of functioning (Shonkoff & Phillips, 2000). Alternatively, families
may initiate a school change during the middle school years because their children are struggling academically.

**Extent of mobility**

Results comparing the unique and joint effects of school and/or residential mobility were very similar to the results for school mobility. The results generally suggest that joint mobility was not associated with better or worse developmental outcomes with one exception. Adolescents who moved homes only (but did not necessarily change schools) only demonstrated externalizing problems; those who moved and changed schools instead only demonstrated achievement deficits. This has important research and policy implications. In terms of policy, with small effect sizes, significant changes are not warranted. Nonetheless, results imply that schools in particular should be sensitive to school transfers during middle school. Such youth may need additional supports as they cope with a new curriculum, teachers, and peers – and perhaps a home.

Repeated moves across childhood and adolescence have consistent adverse associations with adolescents’ internalizing and externalizing behaviors. For no other type of mobility were associations as strong or consistent. It is perhaps unsurprising that youth who changed school several times across childhood and adolescence displayed more problematic behaviors. Repeated instability from a move, and likely in related domains, may lead to compromised functioning in the family, new peer groups and new schools (Anderson, Leventhal, & Dupéré, 2014; Anderson, Leventhal, Newman, et al., 2014; Gillespie, 2014). Coping with repeated stressors could prove challenging, and ultimately result in adverse behavioral outcomes. Accordingly, it may be critical for schools to monitor those youth who they know have changed schools across childhood and adolescence. Relatedly, social service agencies may be advised to promote
residential stability, particularly among low-income families, for whom housing instability and quality can be most problematic (Leventhal & Newman, 2010).

Limitations

Limitations should be noted. As is common in longitudinal study, children missed assessments or dropped out of the study. The use of multiple imputation to address missing data should adequately address this issue, but attrition was problematic. In addition, numerous analyses were conducted, and it is possible that the significant results were due to chance. Finally, observational data are a limitation. Neither type of mobility was experimentally manipulated, and no claims to causality—only association—can be made. Finally, the SECCYD is national in scope but is not nationally representative, nor does it contain an overrepresentation of children from urban areas as present in other studies (e.g., Sampson & Sharkey, 2010). This sample also contains a somewhat more affluent and better-educated population of children than the U.S. as a whole who may not have been as harmed by moving because they were surrounded by supportive contexts, potentially mitigating the adverse consequences of the transition (Zaff & Smerdon, 2009).

Conclusions

School and residential mobility are common events in children’s lives, and deleterious (or even beneficial) consequences can result. To the extent possible, schools should carefully plan the transition of new students. In addition, researchers should attend to both types of mobility when designing studies. However, mobility is not destiny; youth are resilient and adjust to life’s challenges (Masten, 2001).
References


doi: [http://dx.doi.org/10.1016/j.appdev.2013.11.004](http://dx.doi.org/10.1016/j.appdev.2013.11.004)


Table 1

*Mean, Standard Deviation, and Percentages for Variables Used in Regression Analysis*

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>M (SD) or %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Adolescent (age 15) Outcomes</strong></td>
<td></td>
</tr>
<tr>
<td>Math by WJ-R</td>
<td>524.28 (18.51)</td>
</tr>
<tr>
<td>Reading by WJ-R</td>
<td>520.10 (13.28)</td>
</tr>
<tr>
<td>Internalizing (CBCL)</td>
<td>47.23 (11.03)</td>
</tr>
<tr>
<td>Externalizing (CBCL)</td>
<td>49.28 (10.27)</td>
</tr>
<tr>
<td><strong>Child characteristics</strong></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>50%</td>
</tr>
<tr>
<td>White</td>
<td>81%</td>
</tr>
<tr>
<td>African American</td>
<td>12%</td>
</tr>
<tr>
<td>Other race</td>
<td>7%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>5%</td>
</tr>
<tr>
<td>Child temperament</td>
<td>3.32 (.65)</td>
</tr>
<tr>
<td><strong>Maternal characteristics</strong></td>
<td></td>
</tr>
<tr>
<td>Age at child's birth</td>
<td>28.48</td>
</tr>
<tr>
<td>Maternal years of education</td>
<td>14.42 (2.45)</td>
</tr>
<tr>
<td>Agreeableness &amp; neuroticism</td>
<td>.00 (2.94)</td>
</tr>
<tr>
<td>Maternal depression</td>
<td>11.21 (8.81)</td>
</tr>
<tr>
<td>Maternal vocabulary</td>
<td>99.37 (18.89)</td>
</tr>
<tr>
<td><strong>Family Structure</strong></td>
<td></td>
</tr>
<tr>
<td>Number of people in household</td>
<td>4.05 (1.28)</td>
</tr>
<tr>
<td>Two-parent family</td>
<td>73%</td>
</tr>
<tr>
<td>Single-parent</td>
<td>6%</td>
</tr>
<tr>
<td>Other family type</td>
<td>21%</td>
</tr>
<tr>
<td><strong>Income</strong></td>
<td></td>
</tr>
<tr>
<td>Public assistance</td>
<td>16%</td>
</tr>
<tr>
<td>Income/needs</td>
<td>2.91 (2.70)</td>
</tr>
<tr>
<td><strong>Employment characteristics</strong></td>
<td></td>
</tr>
<tr>
<td>Mother in school</td>
<td>3%</td>
</tr>
<tr>
<td>Mother employed</td>
<td>63%</td>
</tr>
<tr>
<td>Father in school</td>
<td>7%</td>
</tr>
<tr>
<td>Father employed</td>
<td>90%</td>
</tr>
<tr>
<td><strong>Neighborhood characteristics</strong></td>
<td></td>
</tr>
<tr>
<td>% residents lived in location &gt; 5 years</td>
<td>49.60 (18.90)</td>
</tr>
<tr>
<td>% owners</td>
<td>84.20 (34.20)</td>
</tr>
<tr>
<td>% single mothers</td>
<td>8.98 (9.42)</td>
</tr>
<tr>
<td>% residents unemployed</td>
<td>4.98 (5.15)</td>
</tr>
<tr>
<td>% residents under poverty threshold</td>
<td>10.26 (11.78)</td>
</tr>
<tr>
<td>Neighborhood median income</td>
<td>41681.51</td>
</tr>
<tr>
<td>Characteristic</td>
<td>$M \ (SD) \ or \ %$</td>
</tr>
<tr>
<td>---------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Study site</td>
<td>(18919.12)</td>
</tr>
</tbody>
</table>

*Note: N = 1,056. Results combined across 20 imputed datasets.*
Table 2
OLS regressions unstandardized coefficients (with standard errors) for adolescents’ achievement and behavior

<table>
<thead>
<tr>
<th></th>
<th>WJ Math</th>
<th>WJ Reading</th>
<th>Internalizing</th>
<th>Externalizing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model 1a:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EC Mob</td>
<td>.16 (.83)</td>
<td>.65 (.62)</td>
<td>1.07 (.71)</td>
<td>.31 (.69)</td>
</tr>
<tr>
<td>MC Mob</td>
<td>.11 (.76)</td>
<td>.44 (.57)</td>
<td>.55 (.71)</td>
<td>.21 (.68)</td>
</tr>
<tr>
<td>Adol Mob</td>
<td>-.09 (.89)</td>
<td>-.78 (.72)</td>
<td>1.56 (.82)+</td>
<td>1.54 (.76)*</td>
</tr>
<tr>
<td><strong>Model 1b:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary Sch. Mob</td>
<td>1.61 (.87)+</td>
<td>1.63 (.68)*</td>
<td>1.54 (.81)+</td>
<td>.64 (.81)</td>
</tr>
<tr>
<td>Middle Sch. Mob</td>
<td>-3.77 (1.47)*</td>
<td>-3.12 (1.12)**</td>
<td>-.79 (1.36)</td>
<td>.79 (1.28)</td>
</tr>
<tr>
<td><strong>Model 1c:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EC Mob</td>
<td>.02 (.82)</td>
<td>.51 (.62)</td>
<td>.99 (.71)</td>
<td>.29 (.69)</td>
</tr>
<tr>
<td>MC Mob</td>
<td>-.02 (.82)</td>
<td>.28 (.58)</td>
<td>.42 (.72)</td>
<td>.15 (.70)</td>
</tr>
<tr>
<td>Adol Mob</td>
<td>.14 (.92)</td>
<td>-.66 (.75)</td>
<td>1.56 (.83)+</td>
<td>1.45 (.80)+</td>
</tr>
<tr>
<td>Elementary Sch. Mob</td>
<td>1.59 (.90)+</td>
<td>1.63 (.70)*</td>
<td>1.08 (.83)</td>
<td>.33 (.84)</td>
</tr>
<tr>
<td>Middle Sch. Mob</td>
<td>-3.80 (1.52)*</td>
<td>-2.95 (1.15)*</td>
<td>-1.29 (1.38)</td>
<td>.34 (1.32)</td>
</tr>
<tr>
<td><strong>Model 2a:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Joint MC Mob</td>
<td>1.61 (.93)+</td>
<td>1.54 (.72)*</td>
<td>1.70 (.86)+</td>
<td>.87 (1.86)</td>
</tr>
<tr>
<td><strong>Model 2b:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Joint Adol Mob</td>
<td>-2.40 (1.79)</td>
<td>-2.81 (1.30)*</td>
<td>-1.70 (1.60)</td>
<td>.04 (1.57)</td>
</tr>
<tr>
<td><strong>Model 2c:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Joint MC Mob</td>
<td>1.80 (.94)+</td>
<td>1.77 (.74)*</td>
<td>1.84 (.87)*</td>
<td>.88 (.86)</td>
</tr>
<tr>
<td>Joint Adol Mob</td>
<td>-2.78 (1.79)</td>
<td>-3.20 (1.31)*</td>
<td>-2.11 (1.61)</td>
<td>-.15 (1.58)</td>
</tr>
<tr>
<td><strong>Model 3:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serial mobility – residential</td>
<td>1.30 (1.20)</td>
<td>-.29 (.95)</td>
<td>2.93 (1.10)**</td>
<td>2.26 (1.04)*</td>
</tr>
</tbody>
</table>

Note: Covariates omitted for parsimony. N = 1,056. Results combined across 20 imputed datasets.

+ p < .10
* p < .05
** p < .01
*** p < .001