CHILD- AND SCHOOL-LEVEL PREDICTORS OF ELEMENTARY SCHOOL MOBILITY AMONG ETHNICALLY DIVERSE CHILDREN IN POVERTY

by

Alex Moffett

A Thesis
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of
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Bachelors of Arts
University of Denver, 2009

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DEDICATION

This is dedicated to MW.

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I would like to thank my family and friends for supporting me through this entire process, be it by understanding the long days writing or providing an outlet to decompress. Drs. Winsler, Curby, Miller were invaluable in helping form a suitable approach to help answer the research questions, and I feel very lucky to have worked with all three over the past two years.

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ABSTRACT

CHILD- AND SCHOOL-LEVEL PREDICTORS OF ELEMENTARY SCHOOL MOBILITY AMONG ETHNICALLY DIVERSE CHILDREN IN POVERTY

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George Mason University, 2016

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School mobility (unscheduled moves to a different elementary school) may contribute to decreased academic performance and social development. Research examining the consequences of school mobility is made more difficult due to the fact that students who move to a different school are initially different than those who do not move schools, thus it is important to understand these selection effects, that is, who is moving during elementary school and how they are different from children who do not experience such mobility? We analyzed the characteristics of children who did and did not switch schools in grades K-5 in the Miami School Readiness Project (MSRP), a cohort-sequential longitudinal study (*N= 33,043)*. Bivariate analyses and multivariate Poisson regressions were conducted with our outcome being dichotomous (yes/no) ever move and the total number of school moves students made from Kindergarten through 5th grade. Overall, 38% of our sample moved to a different school at least once during K-G5.

For those who moved, the majority (66%) only did so once, 30% moved twice, and the remaining 4% moved schools 3 or more times. Bivariately, scoring lower on school readiness assessments at age 4, being Black, attending a lower-quality school, attending center-based care (CBC) or family child care (FCC) center, (as opposed to public school pre-K) at age 4, and having a disability were related to increased probability of moving schools. Controlling for all predictors, the binary logistic component of the multivariate Poisson regression showed that students are more likely to move schools if: a) they attended center based care or family childcare centers compared to students who went to public school pre-K at age 4, b) they are Black compared to White, c) they do not have a disability, and d) they attended a lower-quality school the year before their first move. The count portion of the Poisson regression showed that, in addition to all of the above significant binary logistic predictors, students scoring lower on preschool teacher-reported social skills, and Black students compared to Latino and White students, switched schools more often given that they moved schools at least once. Unlike the binary logistic results, poverty status was associated with more school moves in elementary school, holding all other predictors constant. It is important for future research examining the benefits of school stability in elementary school to control for these selection effects that differentiate those who do and do not switch schools to begin with.

INTRODUCTION

School mobility, at the most general level, refers to children switching from one school to another. Some school moves are planned, like a promotion from elementary school to middle school. In such cases, mobility is expected as students advance through the education system. However, many students experience school mobility well before planned graduation/transition times (Audette, Algozzine, & Warden, 1993). Research on school mobility is most often concerned with potential negative effects of specifically unscheduled school mobility (Alexander, Entwisle, & Dauber, 1996; Gruman, Harachi, Abbott, Catalano, & Fleming, 2008; Ingersoll, Eckerling, & Scamman, 1989; Mehana & Reynolds, 2004) although some research does attempt to analyze potential positive effects of school mobility (i.e. – a move to a higher quality school as a result of parental upward social mobility; Hanushek, Kain, & Rivkin, 2004). Students who move to different schools at unpredictable times are not afforded the same type of planning and consistency in structure that goes into preparing an entire cohort for a scheduled move to a new school environment. It is also important to consider that the instability experienced in a school transition may be worse for some children than others. Also some school moves are due to decisions made by the school system. Even children who do not experience residential mobility may move schools due to redrawing of boundary lines for adjoining school districts, or due to a school closure. Examining school mobility as a unique construct separate from residential mobility helps paint a clearer picture of the ways in which a child's environment can be compromised by unanticipated instability.

According to data gathered in 2004 from the Early Childhood Longitudinal Study, Kindergarten Class of 1998-1999 (ECLS-K), only five percent of students remained at the same school during K-8, while 31% moved once, 34% moved twice, 18% moved three times, and 13% moved schools four or more times (Government Accountability Office; GAO, 2010). Said differently, the majority of children in America experience two or more school moves before they reach high school. Since these annual reports generated by the GAO are focused on K-8 and not solely on elementary school mobility, less data are available about the patterns of mobility in grades K-5. Given research showing that instability and chaos have stronger effects early in life (Evans, Gonnella, & Marcynyszyn, 2005), it is important to explore mobility in elementary school.

Most research suggests that school mobility is associated with negative outcomes (Alexander et al., 1996; Gruman et al., 2008; Ingersoll et al., 1989) but in order to understand outcomes of mobility, we need to better understand the selection effects of school moving in early education. Not all students experience school mobility at the same rate. There are significant differences between those who do and do not experience school mobility according to socioeconomic status (SES) and ethnicity. Children attending schools that are in poorer areas experience higher rates of mobility than schools in less impoverished areas (Alexander et al., 1996; Gruman et al., 2008; Ingersoll et al., 1989). Schools with the highest mobility rates (determined by whether 10% or more of their starting eighth grade students left by the end of the school year) are more than twice as likely to be receiving school-wide Title I funding than schools with lower annual rates of school mobility - 45% of high-mobility schools receive Title I funding school-wide compared to 21% of low-mobility schools (GAO, 2010). Additionally, in K-8, Black children are more likely than any other ethnicity to experience four or more school moves, controlling for SES (GA0, 2010). The current study focuses on describing school mobility in elementary school and its related predictors, from the start of Kindergarten to the end of 5^{5h} grade in a low-income, ethnically diverse sample of students in the Miami-Dade school district.

Theoretical Framework

Bronfenbrenner and Morris (2006) use the term proximal processes to describe the way that our developmental trajectory is influenced by our ecology over time. Their definition emphasized that the individual and environment necessarily interact to form our daily experiences. Stability over time in ecology is important in order for these proximal processes to operate in a successful way because routine and the predictability of useful interactions with the environment probably help manage the increasing complexity and uncertainty throughout life. This is true for any context the child interacts within on a regular basis, with school beginning to be included in that microsystem around the pre-kindergarten years.

Another important aspect of Bronfenbrenner's bioecological model, in addition to what is happening in the immediate environment, is the duration and timing of proximal processes. This aspect of the bioecological theory is helpful in determining whether the timing and frequency of school transfers are important moderators of the overall effect of mobility on academic outcomes. Proximal processes naturally increase with complexity over time. The first few years of education serve as an important foundation to build upon later. Transferring schools early or often in education may disrupt the process of effectively increasing the complexity of interactions with the environment, delaying or even decreasing the trajectory of expected developments later in time. Middle and high schools are, by design, more complex than elementary schools. There are separate teachers for different subjects, usually a larger campus, and more individual input into both class selection and how children choose to spend their free time. Timing is likely an important moderator of school mobility, with mobility in early education being perhaps worse than later school moves (Alexander et al., 1996).

Theories on environmental chaos within and beyond the school context help support the current study by illustrating the negative effects instability in general can have on the overall development of a child. In broad terms, environmental chaos is defined as the predictability of everyday events, including crowding density and ambient noise (Evans et al., 2005). A child who does not know what their parents will be doing on a given day, who shares their home with friends and many extended family members to pay rent and are not able to escape noise from family arguments, music or other auditory sources of distraction is predicted to have negative developmental and academic outcomes. Less predictable and unstructured environments may interfere with an individual's ability to adapt and develop normally, and may contribute to maladaptive behaviors more so than in more predictable and structured contexts. From a developmental/bioecological perspective, environmental instability in early childhood could have far-reaching effects later in life as interaction within different contexts becomes gradually more complex. The school context is no exception.

Maxwell (2010) elaborates specifically on chaos in the physical school environment. Even without a school move, the school context can be chaotic. Factors such as noise level and overcrowding, as Evans et al. (2005) has suggested, are likely to be more prevalent in poorer schools with less resources, where the ratio of student-to-teacher is higher than in schools nested within higher-SES communities. Simply being absent from the school context is also a disrupting factor and may slow social growth or increase the overall chaos levels for a student. In addition to the physical environment, individual differences in reaction to chaos must also be considered as a source of variance. Children who are more resilient to adversity may not be as affected by environmental instability compared to children who are less resilient to adversity (Evans et al., 2005). This emphasizes the importance of considering preexisting differences among those who do and do not move

Predictors and Differential Outcomes of School Mobility

Research on the effects of school mobility is complicated by the fact that not all children are equally likely to switch schools at unscheduled times. This has been shown at the school level and at the child level. On a larger scale, not all schools exhibit the same rates of school mobility. Schools located in the poorest areas tend to experience the most student mobility (Audette et al., 1993). A study on 72 elementary schools in one district showed that schools with lower-SES students had higher student mobility than schools that were not as low on school-level measures of SES (Audette et al., 1993). We are able to improve upon this methodology in the current study by examining poverty at the child-level to further delimit low-SES as a predictor of school mobility.

Other studies have more closely examined child-level predictors and effects of school mobility. Alexander et al. (1996) conducted a longitudinal study on school transfers among students living in a largely urban, Baltimore school district. Over a five-year period, they tracked several individual-level variables – type and number of school transfers, standardized test scores, school grades, SES, grade retention, special education placement, and parent education– for students entering first grade (*N* = 767) in 20 Baltimore schools. Three out of four students stayed within Baltimore during the five-year study. A range of 13-21% of students each year transferred to another school at least once, and more than 60% of students who moved did so within Baltimore (Alexander et al., 1996). Overall, nearly 40% of students moved schools at some point during the five years (Alexander et al., 1996). The schools and students randomly selected within this Baltimore City school system represented an ethnically diverse and low-SES population– 70% of students who stayed in the district the entire five years qualified for free and reduced lunch (Alexander et al., 1996). About 88% of children who moved more than once within-district qualified for reduced lunch compared to about 60% who stayed at the same Baltimore school from first to fifth grade. In addition, Black children represented 70% of students who made single moves within district and 78% of those with two or more moves within-district. Compared to their district-leaving peers, within-district movers on average tended to be from lower-SES families, and did poorer on initial reading and math tests. A number of movers transitioned to schools more than one time over the five years, and a higher frequency of moves was correlated with lower overall academic development by the end of the five-year study, which was taken as evidence of negative effects of moving schools at unplanned times. When comparing mean GPA and California Achievement Test (CAT) scores at 1st grade (the first year of the study before any student transfers were coded), moving two or more times within district did worse compared to those staying at the same school within district, and even worse still compared to those moving outside of the district. When controlling for the initially lower academic performance and SES of the school movers, however, school mobility effects were no longer significant (Alexander et al., 1996). It is difficult to disentangle school instability effects from the more general negative academic and mobility effects of poverty. A blanket statement about school mobility being bad is too obtuse and inaccurate from an applied science perspective. Controlling for child characteristics before school transfers take place is necessary given the numerous reasons why an unscheduled school move would happen during elementary school in the first place.

In addition to an environmental change in context, school mobility is accompanied by a change in teacher as well. Research using data from the Miami School Readiness Project (MSRP) – the same data as in the present study – has previously demonstrated that keeping the same teacher throughout pre-Kindergarten is related to higher teacher reports of children's closeness/attachment with adults by the end of the school year (Tran & Winsler, 2011). Interestingly, their results also indicate that overall behavior concerns reported by the teacher decreased by the end of the year for those who changed teachers. Those who stayed with the same teacher had no difference in reported behavior concerns between timepoints (Tran & Winsler, 2011). Poor goodness of fit was suggested to be present in the first place for the original teacher-child dyad. Children may have changed schools to find a better fit.

Timing of moves has been researched beyond pre-K, using K-12 longitudinal data. Ingersoll et al. (1989) used data from the 1985-1987 Denver Public Schools (DPS) database ($N > 60,000$ students) in combination with census information on SES to assess the effect of timing and type of school transfers on academic achievement in an urban setting. Students were grouped by grade (K-12) and placed into one of five categories of student mobility: 1) students who did not transfer schools within the three-year study, 2) incumbent students who moved once, 3) incumbent students who moved more than once, 4) new students (from out of district) who did not move after their initial transfer, and 5) new students who moved one or more times after their initial transfer to the school. As a proxy for SES, the home address for each student was entered into the federal census database and a variable was created that represented each student's chances of being in poverty by geographical location. When SES was controlled for in their analysis, it accounted for anywhere between 11% and 18% of the variance in academic achievement for each mobility group mentioned above (Ingersoll, 1989). School mobility effects on academic achievement were mitigated, but remained significant for all levels of SES. That is, school mobility is worse for those lower in SES, but still a potential concern for high-SES students, especially as school moves cumulate over time. This reinforces the need to properly control for child-level SES before school moves take place to determine the predictive power of SES for school mobility in relation to later academic outcomes.

Ethnicity was not factored into the analyses, so this study could not speak to differences in school mobility effects on academic achievement between ethnic groups.

Student mobility has also been linked to grade retention. Reynolds (1992) examined the association between grade retention and student mobility with students from Chicago Public Schools. Data on academic performance outcomes were collected for 4th grade students (*N* = 1,255) who stayed in Chicago schools for at least three years beginning in pre-K. The sample was mostly low-income, Black students. Students who changed schools once between pre-K and 2nd grade were 7% more likely to be retained during Kindergarten to third grade than their stable counterparts (Reynolds, 1992). Of seven significant predictor variables, only race (Black, $r = .19$) and parental involvement ($r = -.18$) explained more variance than school transfers in the estimated probability of being held back a grade. While individual SES was not controlled, each school's SES status was included in Reynold's (1992) two-step hierarchical regression analysis. Interestingly, moving to a school higher in SES was positively related to grade retention, suggesting that merely transferring or attending a higher-SES school did not decrease retention rates. A possible explanation for this finding is that higher-SES schools may be more stringent in academic performance evaluations of their students, and thus be likely to retain a child who is underperforming based on the school's criteria.

In another large-scale study using data from Chicago Public Schools, Kerbow (1996), reported on the cumulative effect of school transfers on developmental outcomes, including academic achievement. At the child-level, SES was controlled. Reading and mathematic performance before and after school transitions were included. Movers were categorized into six groups: 0, 1, 2, 3, 4, or 5+ moves in a five-year window – and their means for standardized scores in math and reading performance were plotted by year (1984-1989). The pattern that emerged over time indicated some linear growth in reading performance for all groups, however the growth for highly mobile students (defined as 4 or more school moves) was close to one standard deviation below their non-mobile counterparts (Kerbow, 1996). While there is little difference for those who move schools only once off-schedule compared to no moves, there are cumulative effects of school mobility for the groups who have moved two or more times. Of interest, students who were relatively high in SES for the Chicago sample, but still moved many times over the five years, were more similar to economically disadvantaged peers in terms of academic achievement by the end of the study than to high-SES peers who did not move as often (Kerbow, 1996).

More recent research investigated within-district student transfers in terms of its effect on outcomes of special academic programs geared to help children achieve better language and math skills. Foorman, Petscher, Lefsky, and Toste (2010) illustrate that mobility to even a nearby school can disrupt the experience of special reading programs intended to span over several school years if that new school does not participate in the same program. There were about 120,000 participants in the first year of the cohort starting in grades K through 3rd grade who were followed for five years. Nearly 72% qualified for free and reduced lunch. Academic achievement was measured using SAT-10 (Stanford Achievement Test, 10th edition) and Florida Comprehensive Assessment Test (FCAT) reading scores (Foorman et al., 2010). Over the five years, the achievement gap in reading comprehension between children who moved twice or more compared to those who moved once or not at all remained the same at the end of the study (Foorman et al., 2010). In other words, the achievement gap for reading comprehension did not close. Those children that move only once were quite similar to non-movers, while those that moved twice or more had lower academic outcomes on both the SAT-10 and FCAT reading scores, controlling for SES.

What about parents who move their children because of perceived benefits in higher school quality? Hanushek et al. (2004) obtained school-, teacher- and student-level data from several districts in Texas. Central to their research was answering whether distance of move was a moderator of school mobility effects on academic performance. This is presumably the case because long-distance moves are often purposefully done to seek out better economic opportunity for the family and/or specifically to have their child attend a higher-quality school. Local mobility is thought to occur more often for reasons other than school quality or economic opportunity. The sample size was large, amounting to over 3,000 schools and over 200,000 students from three cohorts followed in 5th through 7th grades. More geographically distant school changes were associated with less cost in academic performance after the move. About 8% of all students transferred to another school within the same district, with poorer and Black children being more likely to move within-district than higher-SES or white children. Additionally, transfers were found to occur non-randomly – a small cluster of schools in low-SES areas appeared to be bearing the bulk of transfers within district each year (Hanushek et al., 2004).

Hanushek et al. (2004) also attempted to control for moves to higher- or lower-SES neighborhoods. Economists have suggested that parents may intentionally move their child to a school they perceive as higher quality that is beyond the current school district (Hanushek, 2004). The rationale given is that the disruption resulting from uprooting their child from their school setting will be outweighed by the quality of the new target school. Parent's knowledge of school quality stems from publically available reports and/or word of mouth from friends and family that may live near the target school. With the prevalence of standardized testing practices across the nation, transparency in school quality has never been higher. Hanushek et al. (2004) conclude that moves across districts, on average, result in significant improvements to school quality for all demographic groups except for Black students. School moves within district, alternatively, do not result in significant changes in regard to school quality, and that costs in academic achievement, while small, were worse for those lower on SES and members of ethnic minority groups. Since research cannot typically answer why a school move takes place, it is important to compare SES before any mobility happens prior to drawing conclusions about the effect school mobility may have on later academic and developmental outcomes.

A recent study looking at elementary school mobility effects on level of school engagement serves as a good example of adequately controlling for child-level variables (Gruman et al., 2008). Predominantly White children in a school district just north of Seattle, Washington (*N* =1,003) and their families were followed from 2^{nd} through 5^{th} grade. They included controls for variables such as initial SES and initial social skills entering 2nd grade, but no information before 2nd grade (Gruman et al., 2008). Also, lack of diverse ethnic backgrounds in the sample makes it dubious for generalizability to more ethnically diverse parts of the nation. Academic performance was defined by annual teacher evaluations of student performance on a five-point scale. Student mobility measures included total number of moves during and between school years of the four years of the study. Student mobility was correlated positively with stressful life events $r = .71$ and negatively, but weakly, with academic performance, $r = .-08$. When SES was included in the final model, student mobility became a non-significant predictor of poor academic achievement. In the final model of the HLM analysis, the total amount of school changes retained a significant beta weight for academic performance, suggesting school mobility contributes some, but far from the most, meaningful explanation to academic outcomes (Gruman et al., 2008).

In support of academic outcomes varying as a function of timing, Mehana and Reynolds (2004) performed a meta-analysis of student mobility studies to discover that those who experience school transfers before 4th grade score significantly lower on academic tests after moves than students who transfer after 4th grade. They used 26 studies and defined student mobility quite broadly as any transfer to another school, on- or off-scheduled transition times, within and beyond districts, between K-6 grades. After computing a standardized effect size of *d* for each study, they discovered that low-SES minorities at or below 4th grade were more impacted by mobility than older students (Mehana & Reynolds, 2004). The authors were able to estimate that mobile students were, on average, four months behind in expected reading and math performance compared to students who stayed at the same school. A main criticism raised by the authors of the meta-analysis is the failure for most studies to control for prior academic achievement before mobility begins.

School mobility is a complex phenomenon. The literature review above suggests that students of low-SES families and with poor school readiness scores make riskier school moves more than those who are higher in SES and with better school readiness scores. Experiencing a high frequency of moves and/or earlier timed school moves is also worse for children in poverty, and in some cases, effect sizes remain significant when controlling for SES, although samples tend to already mostly represent lower-SES populations. Child- and school-level predictors of mobility are both important to factor into any model. This study aims to improve upon existing methodologies to better understand school mobility patterns, particularly in lower-SES communities.

Gaps in the Literature and the Current Study

The current study is based upon data from the Miami School Readiness Project (MSRP; Winsler et al., 2008). The MSRP is a large-scale longitudinal study started in 2002 and currently in its thirteenth year. There are five cohorts of children that have been followed from the time they participated in school readiness assessments at community-based childcare or public school pre-Kindergarten programs at age four as they progress throughout their educational experience in the Miami-Dade County Public Schools System (M-DCPS; Winsler et al., 2008). Before considering the effects of school mobility, we have to have a good understanding of who is moving schools in elementary school and how different they are from those who don't move during these early education years.

School mobility is difficult to accurately summarize due in part to the myriad reasons why a school move takes place. Scheduled moves as a result of graduation and intentional unscheduled moves to a higher quality school are theoretically less concerning than unplanned school moves of those living in poverty, but more empirical evidence is needed to support this claim. Academic performance prior to moving is not always controlled for or defined in the same way across studies (Alexander et al., 1996; Ingersoll, 1989). Often the measures of academic achievement begin the year that the study began, which is not always the child's first year in school. We report the actual school grades and scores on standardized tests before school moves. To my knowledge, only one other study, by Tran and Winsler (2011), has examined school readiness scores in early childhood (at age 4) as a predictor of school mobility. The current study hopes to expand upon their research to include school mobility rates through fifth grade, by looking for an effect of school readiness measures in a similar way. At the school level, school quality before and after a move is not consistently defined and accounted for in previous literature (Alexander et al., 1996). Included in the MSRP are official state-driven performance evaluations of schools.

In the past, the school mobility literature has been criticized for not controlling for variables that contribute to the developmental trajectory of students in elementary school (Gruman, 2008). As early as 1976, researchers have cautioned the interpretation of school and residential mobility effects for studies that failed to adequately control for child-level

SES, school readiness, academic performance and other related variables before school mobility took place (Schaller, 1976; Strand & Nelson 2002). When variables like SES and academic performance are included as predictors in quantitative analysis, the effect of school mobility is usually reduced, but still present (Gruman et al., 2008; Ingersoll et al., 1989). Said differently, most research exploring school mobility finds that children who are already at an economic disadvantage and performing poorly in school are most likely to by affected by experiencing an unscheduled move in elementary school. Worse, children from lower-SES backgrounds typically move the most number of times during elementary school (Alexander et al., 1996; Hanushek et al., 2004, Kerbow, 1996). School readiness assessment scores are another important resource for predicting which children are most likely to move, and are often not available for analysis, making controlling for previous performance on language, behavior, and social skills before the move impossible to do. The scale of studies, even for research that does well to control for important variables, is often smaller than desired (Alexander et al., 1996; Gruman et al., 2008, Mehana & Reynolds, 2004). Drawing from the limitations and strengths of the research mentioned, a large-scale, longitudinal study that includes variables for school readiness, school quality, SES, and ethnicity would lend itself well for exploring school mobility.

The following research questions were examined (hypotheses are presented after each question):

1. How often do low-income, ethnically diverse, MSRP students move schools during elementary school within the Miami-Dade County Public School system

(MDCPS)? In this sample, how many low-SES, ethnic minority children stay at the same exact school K-5? Since most studies (Alexander et al., 1996; GAO, 2014; Hanushek et al., 2004) show that the majority of low-income, ethnically diverse students move at least once during primary and/or secondary education, it is hypothesized that pattern would hold for our sample (non-movers are hypothesized to still be the majority). The next most prevalent category would be twice-movers, followed by students who move three times or more during K-5.

2. Do children move schools more often early or later in elementary school (during K-2 or 3-5)? For this subsample mostly living in poverty, I thought that mobility rates would remain relatively consistent throughout K-5.

3. Are children with poorer social skills and behavior upon school entry more likely to move schools and move more often compared to children who have average or excellent social skills and a lack of reported behavior problems? It was hypothesized that children who move schools and move more often will initially have poorer social skills than those who do not move schools, after controlling for SES.

4. Are there gender differences in who moves schools during elementary school? Research typically focuses on whether there are gender differences in mobile groups for academic outcomes, not in selection effects for who is likely to move in the first place (Alexander et al., 1996: Kerbow, 1996). Males in the MSRP are more likely to be identified by a teacher as having behavior concerns (Winsler et al., 2008). Boys might be moving more often than girls just for this reason alone. When behavior problems are

controlled for, school mobility rates were hypothesized to be comparable between genders.

5. Are there ethnic group and poverty status differences in who moves schools during elementary school? There is scant research on school mobility that does not suffer from a restriction of range in ethnic makeup of the sample. I suspected that mobility rates in this sample will be comparable to previous studies based in low-SES areas of Chicago and Baltimore (Alexander et al., 1996; Kerbow, 1996) and national reports given by the Government Accountability Office (GAO, 2014). To this degree, it was hypothesized that Black children will move schools the most during K-5 compared to Latino and White children, even after controlling for SES.

6. Are children who move initially attending lower quality schools on average than children who stay at the same school? Children were hypothesized to be more likely to move schools, and move more often, if they were attending a lower-quality school. A number of studies indicate that lower quality schools bear the bulk of incoming and outgoing student transfers each year (Audette et al., 1993, Hanushek et al., 2004).

7. Are children who have special educational needs in pre-K more likely to move than typically developing children in elementary school? There is no known research on special education and school mobility rates that could have helped inform this hypothesis, however, I thought that children with special needs would perhaps move more than typically developing children in part to find better resources to accommodate their primary exceptionality. We cannot directly assess this as the reason for a school move, but can assume that schools are obligated to consider transferring their special-needs

students if it is known that another school may be a better fit to handle the primary exceptionality.

8. Is there a difference in school mobility rates for children who attended public school pre-K versus childcare/family care programs with subsidies at age four? Winsler et al. (2008) demonstrated that children who attend public school pre-K programs typically made better gains in cognitive and language development by the end of the school year than those in center based care or family childcare. I hypothesized that children who attended public school pre-K are likely to move less often during K-5 than those who attended community childcare programs. That children are generally doing better in public school pre-K might indicate more stability of enrolled students over the year and/or better school quality.

9. Controlling for all other variables, which variables still significantly and uniquely predict school mobility? It is hypothesized that SES and ethnicity will remain significant controlling for all other variables.

METHOD

Miami-Dade County Public Schools (M-DCPS)

M-DCPS is one of the largest and most diverse school systems in the US, serving over 340,000 students from over 100 countries (Office of the Superintendent, M-DCPS, 2014). In 2013, nearly 66% of students were Latino, 23% Black and the remaining 11% were White/other (Assessment, Research, and Data Analysis, ARDA, M-DCPS, 2013). The rank order of this ethnicity breakdown has remained stable since the mid-1990's. About 78.5% of elementary school students qualified for free/reduced lunch in 2013 across M-DCPS (ARDA, 2013), which our MSRP sample closely resembles.

Participants

The Miami School Readiness Project (MSRP) was designed as a longitudinal, county-wide program evaluation. Almost the entire local population of children receiving subsidies to attend childcare programs and children attending public school pre-K programs were assessed for school readiness throughout 2002-2007 and followed into school. This leads to a cohort sequential structure, where a new cohort of incoming children is added each year through 2002-2007. On-time Kindergarteners, for example, can have data from the 03-04 school year through 08-09 school year depending on which cohort they are in. I restricted the sample for this study to children from grades K through G5 enrolled in M-DCPS elementary schools that had at least two consecutive years of information on the school they attended (*n* = 33,043). Children from all five cohorts are included (Cohort A = 6,457, Cohort B = 7,403 Cohort C = 8,940, Cohort D = 8,843, Cohort *E* = 6,988). Only students who are on time, in regard to their grade level each year, were included for this study. Those who had been retained or skipped a grade between K-5 were excluded from analysis (14.5% of the larger K+ sample). Gender in this subsample is fairly balanced with 48.5% female. Ethnicity is broken down into three categories: Latino (58.3%), Black (34.4%), and White/other (7.2%). The percentage of children qualifying for free and reduced in kindergarten was 77.6%. About 57% of our sample was English language learners. Primary exceptionality status, which was calculated by collapsing across all disability codes and not counting gifted students as disabled, was present in 11.3% of students in their Kindergarten year.

Measures

Child-level variables

Demographics.

At the child-level, demographic data were collected, often annually, for each student in the MSRP. Date of birth, gender, ethnicity, student language, and home language, were gathered from parent reports/school records each year.

Special Educational Needs.

There are 22 broad categories of primary exceptionality that a child could be assigned to in the MSRP dataset as determined by the school district. The categories range from physical, emotional, cognitive, and developmental impairments to gifted status, although gifted students were not considered as having a primary exceptionality in this study. Since first grade contains the most number of children assessed for special education (n = 31,588) across cohorts, our analyses included a dichotomous yes/no primary exceptionality variable in G1 as a predictor.

Preschool Cognitive, Language, and Motor Skills.

Children's pre-academic skills were assessed through the Learning Accomplishment Profile–Diagnostic (LAP-D; Nehring, Nehring, Bruni, & Randolph, 1992), which was chosen by the community because it lined up with the states' Early Learning Performance Standards, was available in Spanish (piloted and standardized in this community) and English, and was for large-scale use. The LAP-D is a national, norm-referenced instrument with strong internal consistency reliabilities both nationally (α = .76–.92; Nehring et al., 1992) and within the larger MSRP sample (.93–.95; Winsler et al., 2008). The LAP-D is a standardized direct assessment and we used three subscales: cognitive (matching and counting), language (comprehension and naming), and fine motor (writing and manipulation). The LAP-D is intended for children between 30 and 72 months of age and was administered by children's pre-K teacher at the beginning (Time 1—September/October) and end (Time 2—April/May) of the children's 4-year-old academic year. Teachers administered the LAP-D at public school pre-K programs while outside trained assessors were responsible for administering the LAP-D at center-based care and family childcare programs. Spanish and English versions of the LAP-D were available, both of which have demonstrated strong test–retest reliability (α = .93–.97; Hardin, Peisner-Feinberg, & Weeks, 2005). We used the second time point of LAP-D measurement when available (Cognitive n = 13,360) as it is temporally the closer to school entry, however, the first time point was used if the second time point (Cognitive n

= 5,583) was unavailable. If neither of those two were available, there is a time zero point at age three that was used (Cognitive *n* = 1,034).

Social-emotional Skills.

At the same time points as the LAP-D, parents and teachers reported on children's socio-emotional and behavioral strengths with the Devereux Early Childhood Assessment (DECA; Lebuffe & Naglieri, 1999), which consists of four subscales: initiative, self-control, attachment, and behavior concerns. The DECA was available in both English and Spanish, with parents and teachers choosing the language in which they were most comfortable. Both parents and teachers were asked to rate children's social skills and behavior from the prior 4 weeks on a 5-point scale (0 = *never*, 1 = *rarely*, 2 = *occasionally*, 3 = *frequently*, and 4 = *very frequently*). The first three subscales (initiative, self- control, and attachment) combine to make a total protective factors score (TPF), in which bigger numbers signal greater socio-emotional strengths. The behavior problems subscale stands alone and bigger numbers are indicative of greater behavior problems. Sample questions from the initiative subscale include "starts or organizes play with other children," whereas an example item for self-control includes "listens to/respects others." For the attachment subscale, an example includes "responds positively to adult comfort when upset," and an example of the behavior scale items includes "fights with other children." It should be noted that the internal consistency within this community sample is strong—teacher TPF = .94, teacher behavior concerns = .80; parent TPF = .91, parent behavior concerns = .71 (Crane, Mincic, & Winsler, 2011). Further, there are no differences in the reliability of these scales as a function of the language in which the

DECA was completed or between Latino and Black children (Crane et al., 2011); thus, the DECA has strong reliability for ethnically and linguistically diverse children, those sampled within this study. Just as with the LAP-D measures, we used the second time point of measurement (Teacher total protective factor n = 19,501) when available and used the first time point as an alternative (Teacher total protective factors n = 6,274)), if the second time point were missing.

School Mobility.

This is our primary dependent variable. There are two categorical measures and two continuous measure of school mobility used for analysis (described below). School mobility was calculated by first using the school ID assigned to each student each year and determining whether school IDs match from grade to grade (i.e., K-G1, G1-G2, G2-G3, and G4-G5). By design of the MSRP, we can only report on students who move locally and stay in the longitudinal study for at least two consecutive years. Those who move out of MDCPS, or have missing data for one of any two consecutive years, were given a missing value in our dataset for that pair of years. We created two types of categorical variables for school mobility: yes/no ever moved K-5, yes/no moved in a particular pair of years, and two continuous variables: total number of school moves K-5, and a more conservative total of school moves capturing only children staying in the MSRP for the entirety of K-G5. Children who remained at the same school over two consecutive years received a value of 0 and those who did move schools received a 1, and as mentioned above, a dot was given to cases where there were missing data for either of the two years.

Timing of first move. In addition to the overall frequency of school move, a variable was created to track when children first moved during K-5. This variable allowed us to determine from what grade to get pre-move GPA and school performance data. For example, a student moving for the first time during the G3-G4 transition has pre-move GPA data up until G3, whereas a student moving in G1-G2 only has G1 GPA that can be used as a pre-move predictor in our analyses. The values range from 1 to 6, with larger numbers indicating their first move occurred later in elementary school. Non-movers received a "6" indicating that they stayed at the same school across all five transition times (all school ID values for child are equal for all years). Students moving for the first time between G4 and G5 received a "5" to indicate they moved for the first time at last possible transition time. Students who did not move until G3 and G4 for the first time received a "4" to indicate they stayed at the same school until the second-to-last transition time. Students moving between G2 and G3 received a "3", students moving for the first time between G1 and G2 received a "2", and finally, students moving between K and G1 received a "1" to indicate that it took just one grade for them to experience their first move.

School-level variables

School Quality.

For each year, schools are graded by the state largely on their eligible student's performance on the Florida Comprehensive Assessment Test (FCAT) (M-DCPS, 2014; Wongbundhit, 2014). The percentage out of all eligible students who end up taking the reading and math sections of the FCAT determine a grade for the school ranging from A-

F, where an A reflects that most students who were eligible took the test and their average scores or gains in scores from the previous year were adequate for students in reading, math, and writing, and an F indicates that less than 90% of eligible students took the FCAT and their scores or gains from the previous year were inadequate. We transformed these ordinal measures (A, B, C, D, and F) into numerical units (A=5, B=4, C=3, D=2, F=1) and treated them as continuous for our analysis.

School performance is available for each school year from 2003-2013. To account for the cohort-sequential design, however, several steps were required to merge in the annual school performance data at the child-level. First, we split the file into five separate files for each cohort (A, B, C, D, and E). Next, we identified the year that on-time students were in a specific grade for their specific cohort. For example, Cohort A Kindergartners were assigned a school quality grade from the 2003-2004 school year, and Cohort B Kindergartners were assigned the 2004-2005 school quality grade reported by the district. After all students in all cohorts were properly assigned school quality, the datasets were then merged back together, resulting in six variables that captured the school performance for each grade (K, G1, G2, G3, G4, G5).

School Quality in Year Prior to Student's First Move.

Once school performance was entered into the dataset, we created a single variable that reflected the school performance the year prior to a student's first move within the district. The possible range of first moves was 1-6, where 1 indicated that a student moved schools for the first time between Kindergarten, and 5 indicated that they moved between G4 and G5. The 6 value for first move reflects that they stayed at the same school through all of K-G5. Depending on what value (1-6) students had for their first move, they were assigned the proper school quality value for the year prior to their first move (1 = Kindergarten school quality, 2= G1 school quality, 3 = G2 school quality, 4 = G3 school quality, 5 = G4 school quality, 6 = Kindergarten school quality). Since those who stayed at the same school all 5 years did not have a possible pre-move school quality value, it was decided that we would use their Kindergarten school quality information for analyses to determine whether school quality in Kindergarten was significantly different for movers and non-movers.

Data Analyses

We ran descriptive analyses and performed exploratory data analysis to determine the shape of the distribution of the continuous measure of school mobility because it was likely to be very positively skewed with most children not moving schools. Indeed, the majority of children did not move schools each year, which is a blatant violation of OLS regression assumption of normal distribution.

Possible cohort effects that could affect school mobility, including hurricanes and sweeping changes to school policy, appear to not have played a large role. There were a few hurricanes of note in the early 2000's, for example. However, comparing across cohorts, the percentage of students who moved was not significantly different from the average mobility rate across all years.

Bivariate analyses are first included to compare to prior research (Alexander et al., 1996; Gruman et al., 2008; Hanushek et al., 2004; Ingersoll et al., 1989; Kerobw, 1996; Schaller, 1976). The main analyses, however, were conducted through Poisson regression models to account for the large number of students staying at the same elementary school over time across all years.

Because of the highly skewed distribution of values for our dependent variable of school mobility, we estimated Zero Inflated Poisson (ZIP) regression models using Mplus 7.0 statistical software (Muthén & Muthén, 2007) for the majority of our analyses. Poisson regression models are appropriate to use when the dependent variable is a frequency variable with a high number of zero values (for example, when a large percentage of the sample stays at the same school during Kindergarten through fifth grade). ZIP regression models are able to correct for overdispersion resulting from a high number of zero values by considering the variance and mean parameters equal to each other. In ordinary least squares (OLS) regression, variance and mean are independent of each other and can take on different values. An advantage of the ZIP approach is the simultaneous estimate of logistic (yes/no ever moved schools K-5) and frequency dimensions (how many times a moving student moves schools K-5) of the dependent variable. The logistic component estimates the odds of membership to the zero value category (non-movers). The frequency component estimates the association between our independent variables and the frequency of the non-zero values of our dependent variable.

RESULTS

1. *How often do low-income, ethnically diverse MSRP students move schools during elementary school within the Miami-Dade County Public School system (MDCPS)? How many children stay at the same exact school throughout K-5?*

Overall, about 38% of all students in our sample moved schools at least once during elementary school. See Table 1 for a detailed breakdown of the frequency of school mobility. Children who are advancing on schedule in regard to grade completion move schools at a declining rate throughout elementary school, with the sharpest decline in G4 to G5. Between Kindergarten and G1, 14.6% moved schools, while G1-G2 had 13.4%, G2-G3 had 13.3%, G3 –G4 had 12.9%, and G4-G5 had 9.2% of on-time students moving schools.

We also ran analyses with students who had school ID data for all school year transitions (i.e. – stayed within-district for all of K-G5). Overall prevalence of school mobility for children remaining in the MSRP for all of elementary school was similar, with 39.9% of students moving to at least one different elementary school some time throughout K-G5.

Regarding the total number of moves, as expected, most students did not move (n = 20,551, 62.2%). Of those who moved, most students moved only once (n = 8,663, 69.3%), followed by two (*n* = 2,867, 23.0%), three (*n* = 781, 6.3%), four (*n* = 165, 1.3%), and a very small number moving at every transition time (*n* = 16, .1%).

For students staying within the school district all years K-G5, most moved for the first time during the K-G1 transition (*n* = 2,634, 32.5%). Second was the G1-G2 transition (*n* = 1,863, 23.0%), third G2-G3 (*n* = 1,571, 19.4%) fourth G3-G4 (*n* =1,344, 16.6%), and fifth G4-G5 (*n* = 690, 8.5%). The total number of students staying in the district, but never transitioning to another school, was 12,704 out of the 20,806 students staying in district all five years (61.1%).

2. Is there a difference in school mobility rates in early vs. late elementary school?

As noted from the figures above in Table 1, there was a steady decline in school mobility from K-G5. K-G1 had the highest rate at 14.6%, and by the time students got to G4-G5, less than 10% of students in our sample were moving schools.

Bivariate Inferential Analysis

3. Are children with poorer social skills and bad behavior upon school entry more likely to move schools and move more often compared to children who have average or excellent social skills and a lack of reported behavior problems?

For the categorical measure of school mobility, a one-way ANOVA was used with the IV as yes/no ever moved and the DV was each of the 14 subscores of the LAP-D and DECA. In Table 2, comparing LAP-D and DECA scores of children who ever moved schools K-G5 to non-movers, the children who moved schools at least once in K-G5 had lower scores on every school readiness measure at age 4 except for gross motor skills.

When the homogeneity of variance assumption was violated, the Welch F significance level was reported. Effect sizes ranged from .05 to .16, with the largest effect size seen on teacher-reported child self-control and child behavior concerns.

For the continuous measure of school mobility (total number of moves K-G5 for those who moved, possible range of values = 1-5), correlations were used with the DV being total number of moves for any school transitions K-G5 and the IV being the 14 subscales of the school readiness assessments for those who moved. LAP-D scores were weakly but negatively correlated with total number of moves (see Table 3), as was the DECA, except for behavior concerns, which were weakly positively correlated with total number of moves. Specifically, Teacher DECA scores of attachment ($r = -.047$), self-control ($r = -.065$), initiative ($r = -.031$) total protective factor ($r = -.055$), and behavior concerns ($r = .067$) were all significant. For the parent DECA measures, attachment ($r = -.030$), self-control ($r = -.031$), initiative ($r = -.032$) total protective factor ($r = -.033$), and behavior concerns ($r = .026$) were all significant. Of the four measures that make up the LAP-D (gross and fine motor skills, cognition, and language) gross motor skills ($r = .025$) was the only non-significant correlation, fine motor skills ($r = -.063$), cognition ($r = -.039$), language ($r = -.035$) were all negatively and weakly correlated with total number of moves. Bivariately, the more a student moved, the worse they did on school readiness measures.

4. Are there gender differences in who moves schools during elementary school?

We ran a two-way chi-squared test, with the categorical X as gender and categorical Y as yes/no moved schools ever to determine if males and females were equally likely to move. In Table 4, one can see just how close the actual percentages were for mobility for each gender, and the chi-squared test showed that school mobility was equally likely for either gender in our sample, χ^2 (1, *N* = 32,962) = .086, *p* = .77. We also ran a one-way ANOVA test of gender with our continuous measure of number of moves, filtering out non-movers. There was no significant difference between genders for total number of moves in elementary school for those who moved (*F*(1, 12,484) = 1.617, p = .20).

5. Are there ethnic group and poverty status differences in who moves schools during elementary school?

We ran a chi-squared test with the categorical X being race and the categorical Y being yes/no ever moved schools. There were significant differences between ethnic groups and ever experiencing a school move K-G5, χ^2 (2, *N* = 32,946) = 605.253, p < .001). As Table 4 highlights, about one-third of the all Latinos moved schools at least once K-G5. For Black students, the percent experiencing at least one move in elementary school is higher than any other ethnicity category at 46.4%. White, Asian, or other students moved elementary schools the least of all ethnic categories, with about one in every four moving schools at least once. After selecting cases that filtered out non-movers, a one-way ANOVA with our continuous total number of moves variable also revealed significant differences between ethnic groups for total number of moves (*F* (2, 12,480) = 240.193, *p* < .001), with Black children moving a greater number of times (*M* = .46, *SD* = .50) in elementary school than any other ethnicity group (White, Asian, Other *M* = .25, *SD* = .44; Hispanic *M* = .34, *SD* = .48) .

Regarding poverty status, there were also significant differences for school mobility. A chi-squared test with the categorical X being yes/no received free or reduced lunch (FRL) and a categorical Y being yes/no ever moved showed that children living in poverty are more likely to experience a school move in K-G5, χ^2 (1, *N* = 27, 786) = 376.523, *p* < .001). In Table 4, one can see that 40.4% of FRL children moved at least once and only 26.9% of non-FRL children moved at least once. Additionally, an ANOVA (F (1, 10,382) = 102.787, *p* < .001), after filtering out non-movers, showed that children reciving free or reduced lunch were more likely to move more often (*M* =1.43, *SD* = .701) than children who did not qualify for free or reduced lunch (*M* = 1.25, *SD* = .541).

6. Is there a difference in school mobility rates for children who attend public school pre-K versus childcare programs with subsidies?

Children attending center-based or family childcare centers at age 4 were more likely to move schools in elementary school than their public school pre-K counterparts χ^2(1, *N* = 30,723) = 155.661, *p* < .001) (see Table 4). Whereas 41.8% of all center-based and family childcare center children moved schools during K-G5, about 35% of public school pre-K attending children moved schools during K-G5. After filtering out non-movers, a one-way ANOVA revealed a significant difference in total number of school moves in elementary school between public school pre-K and center-based or family childcare attending children (*F* (1, 11,327) = 14.194, *p* < .001), with public school pre-K children moving schools fewer times than children attending center-based or family childcare centers (Center-based and family care *M* = 1.42, *SD* = .70; Public school *M* = 1.37, *SD* = .66).

7. Are children who have special educational needs in G1 more likely to move than children who do not have a primary exceptionality?

A two-way chi-squared test, where the categorical X was yes/no special needs in G1, and the categorical Y was yes/no ever moved schools, revealed that children who have no primary exceptionality were more likely to move than children who have a primary exceptionality, χ^2 (1, *N* = 31,588) = 36.903, p < .001). Still closely resembling the overall mobility rate in the sample, 34.6% of students with a primary exceptionality and 38.9% of typically developing students in G1 moved at any point in elementary school. A one-way ANOVA test using our continuous measure of total number of moves and non-movers filtered out also suggests that students who do have a disability move less often compared to students who are not in special education (disabled *n = 1,956, M* = 1.32, *SD* = .609, not disabled *n* = 10,093, *M* = 1.42, *SD* = .696) (*F* (1, 12,049) = 32.825, p < .005).

8. Are children who move initially attending lower quality schools on average than children who stay at the same school?

A chi-squared test, with the categorical X as yes/no school move and the categorical Y as the school performance for the year just prior to the school move showed that there were significant differences between movers and non-movers for average school grades/quality (4, *N*= 22,496) = 893.976, *p* < .001). Of the 1,450 students attending a school with a grade of “F” or “D”, 933 (64.3%) students moved at least once during K-G5. Of the 12,603 students who attended an “A” school, 4,451 (36%) attended were mobile students (see Table 4 for more details). With non-movers filtered out, a one-way ANOVA with school performance treated as a continuous DV and yes/no ever moved as the categorical X also indicated significant decreases in school moves as school performance/grade increased (F (4, 22,496) = 232.691, $p < .001$; School grade of F, M = .71, SD = .45; D, M = .62, SD = .49; C, M = .56, SD = .50; B, M = .47, SD = .50; A, M = .36, SD = .48). As school quality decreases, school moves increases.

Multivariate Analysis

9. *Controlling for other variables, which variables uniquely predict school mobility*?

The ZIP regression model yields two separate analyses: a binary logistic regression predicting membership in the zero class (non-movers), and a regression based on the natural logarithm of counts (number of times moved schools) for the non-zero class (movers) that indicates which covariates predict moving more often. The unstandardized regression weights for the binary logistic portion reflects the likelihood of staying at the same school for every unit increase in a given predictor, holding all other predictors constant. The unstandardized regression weights for the count portion reflect how many more moves happen with every unit increase in a given predictor (given that the student moved at least once), holding all other predictors constant. I will talk about each regression analyses separately below, then compare results to each other and to bivariate results in the discussion section.

Predicting membership in the zero class (not moving schools) is the opposite of what we are actually interested in for this analysis: moving schools. This is just an artifact of the way ZIP handles the excess zeros in the data, so I will be reporting in terms of more likely to *stay* rather than more likely to *move* for the logistic portion. See Table 5 for the exponentiated beta weights (odds ratios) in the binary logistic model for the percent change in the odds of moving schools. Of the 11 predictors, 4 were significant in the binary logistic model when entered simultaneously. Children who attended subsidized childcare were less likely to stay at the same school (more likely to move) throughout grades K-5 compared to children who attended public school pre-K (b = -.085, p < .05). Children who attended higher quality schools were more likely to stay at the same school (less likely to move) throughout grades K-G5 compared to children attending lower quality schools (b = .212, p < .001). Children in special education programs were less likely to stay at the same school (more likely to move) than typically developing peers (b = -.075, p < .05). Children who had higher teacher-reported behavior concerns on the DECA were only slightly less likely to stay at the same school (more likely to move) than children with lower scores (b = .099 , p < .05). Gender, ethnicity, school readiness, and poverty status did not matter for predicting school mobility in this model with all variables included.

Of the same 11 predictors used in the binary logistic model, 6 were significant in the count model when entered simultaneously. When children attending subsidized childcare at age 4 did move, they moved more often (b = .218, p < .001) compared to children who attended public school pre-kindergarten. When children in special education programs moved, they moved less often (b = -.225, p < .001) than typically developing children. Both White (b = -.226, p < .01) and Latino (b = -.430, p < .001) children moved less often compared to Black children given that they moved at least once. Whereas poverty did not matter for predicting moving schools ever (yes/no), for children who moved at least once, children living in poverty moved more often compared to children not receiving free or reduced lunch ($b = .347$, $p < .001$). Mobile children attending higher-quality schools moved less often ($b = -.323$, $p < .001$) compared to children who attended lower quality schools. Gender and school readiness measures were not significant predictors in the count portion of the Poisson regression.

DISCUSSION

In this thesis, I sought to better understand what predicts school mobility in an ethnically diverse, low-income sample. Environmental instability can alter developmental trajectories (Bronfenbrenner & Morris, 2006), and it is important to identify children who are more likely to move and move more often, because changes in development are occurring at faster rates than later in life. Those already at risk for developmental delays because of factors outside of school mobility may unfairly incur additional threats to development because of school mobility. There are many reasons why a child might move schools, and as such, there is a need to more completely uncover which types of moves might be more detrimental to development. As researchers, information on why students switch schools is often not available, however, we may speculate that some of the major reasons include: school closure due to insufficient test performance or funding, restructuring school district lines, expulsion (Gilliam & Shahar, 2006), parents opting to move their child to a perceived better school nearby, intentional residential mobility, and unanticipated residential instability. We contribute to the literature by examining a number of child- and school-level predictors of school mobility among low-income, ethnically diverse children in a large cohort-sequential longitudinal sample.

A number of notable findings on school mobility emerged from the bivariate and multivariate analyses. Consistent with previous research (Alexander et al., 1996; Gruman et al., 2008; Ingersoll et al., 1989; Kerbow, 1998), we found that the majority of children in K-5 stay at the same school for all years. Alexander et al. (1996) reported that about 40% of all children in their sample moved, which was close to our 37.8% estimate. Gruman et al. (2008) reported that 50% of their sample moved schools at least once during grades 2 through 5. Ingersoll (1989) reported their results by grade, and the range of students who stayed at the same school ranged from about 70% to 87%. Kerbow (1998) reported that, on average, about 20% of students in Chicago elementary schools move schools each year, but that this average does not accurately portray the high mobility rate seen in the poorest of schools in Chicago. Also consistent with earlier studies (Gruman et al., 2008; Ingersoll et al., 1989; Kerbow, 1998), of those who did move, most moved only once, with a rapid declining rate of children moving more than once. Children moved most often between Kindergarten and first grade, again, with a decline in mobility rates as they advanced in grade. Ingersoll (1989) found a similar pattern of early-education mobility, with G1 students accounting for about 32% of their mobile sample, declining to about 8% by the time students in the sample reached 12th grade.

In a recent study that also utilized data from the Miami School Readiness Project and also examined school quality but focused on early mobility between public school Pre-Kindergarten programs and Kindergarten, ethnic minority and poverty status were significant predictors of early mobility. Both Blacks and Latinos were much more likely to move schools (73% and 46%, respectively) controlling for other predictors, which we also found in our analyses for the same sample in elementary school. When Pre-

Kindergarten school quality was added to the logistic regression model, the odds of moving schools decreased by 20% for every unit increase in school quality (Hines & Winsler, 2016) which was similar to our 50% decrease in odds of moving schools. Thankfully, most students attended high-quality schools in the MSRP sample, but the small number of students who attended lower-quality schools moved more often in both studies. This is not necessarily a negative thing, Hines and Winsler (2016) found that only 16% of students experienced a move to a lower-quality school, so perhaps mobility can be partially explained by families seeking better school quality.

Children in poverty moved schools more than children who did not qualify for FRL in the bivariate analysis, however in the binary logistic ZIP model, poverty was a non-significant predictor for likelihood of moving. The restriction of range on SES, as well as school readiness measures and school quality being entered as a covariates most likely share much of the variance that our poverty variable was contributing. However, when we removed all of the school readiness variables and school quality from the binary Poisson model, SES was still not significant.

Bivariate and multivariate analyses between ethnicity and school mobility were also largely in line with previous research (Alexander et al., 1996; Gruman et al., 2008; Kerbow, 1998). Of all movers, black children moved the most, compared to Latino and White children. This was also true in the multivariate model, controlling for a number of other predictors. It is interesting to note that even among studies with varying ethnic makeup, Black children continue to be at increased odds of moving schools, and when they do move, they move more often than any other ethnic group. Further research is needed to help answer why there is such high mobility, what outcomes mobility is associated with, and how policy makers can help offer stability for families experiencing or at high risk for many school moves.

There were no significant differences in mobility rates between genders, even after controlling for behavior concerns, so my hypothesis of boys with behavior problems moving more than girls was not supported. Previous research often controls for gender (Gruman et al, 2008; Alexander et al. 1996) along with school mobility when predicting outcomes associated with moving schools, but no research to my knowledge has evaluated gender as a predictor of school mobility. Based on my findings, it is important for future research to continue to include measures of behavior concerns for both genders as possible predictors of mobility.

Significant differences were found between early center-based and family daycare compared to student who went to public school pre-K at age four. Students who attended subsidized childcare moved, and moved more often, when they got to elementary school in the both the bivariate and multivariate analyses. We collapsed both center-based childcare and family-based childcare into one variable because they both are separate entities from the public school system. Starting pre-Kindergarten at a location that already has an associated elementary school program may make staying at the same school easier.

Children in special education programs ended up being more stable in the bivariate analysis, however special education children increased odds of moving in the multivariate analysis. When special education children did move, they moved less often than their typically developing peers. My hypothesis that special education children would move more was not supported, but a possible explanation for the results is that they made a strategic move to a school with better resources for their needs early on and stayed put for most of their school experience during grades K-5.

School readiness at age 4 revealed significant differences between movers and non-movers at the bivariate level. Movers performed significantly worse across all dimensions of the LAP-D and DECA (with the exception of gross motor skills) compared to non-movers, with the biggest effect size coming from teacher behavior concerns. Behavior concerns reported by the preschool teacher remained a significant predictor in the multivariate model for moving as well as number of moves. Gilliam and Shahar (2006) examined pre-Kindergarten expulsion rates and found that there were a disproportionate number of male and ethnical minorities represented. Behavior concerns as reported by the teacher often persisted into the K-12 years. It appears from this study that child behavior problems uniquely predicts school mobility which suggests that students are either getting kicked out of schools or parents are looking for different schools that might be better equipped to deal with the child’s behavior problems. Further research is needed to explore teacher-student relationships.

School quality before the first move mattered a fair amount regarding frequency of mobility, with a little more than one-third of children attending the highest quality schools moving schools compared to nearly three-fourths of children moving who attended the lowest quality schools prior to moving. This is not surprising. Although we do not know why students move in this data set, it would be reasonable to think that a number of the children who moved away from the lowest-quality schools did so seeking better education. Future research might want to explore the quality of schools post-move to test whether there is a pattern of moving to a better, equally bad, or worse school. We will do this in a subsequent paper for the elementary school years in a subsequent paper, just as Hines and Winsler (2016) did for the pre-Kindergarten to kindergarten transition.

Overall, we were able to contribute to the literature in a few different ways. We used a large, cohort sequential, dataset of ethnically diverse and low-income children who might already be at risk for environmental instability and developmental delays (De Feyter & Winsler 2009; Evans et al., 2005; Evans et al., 2010; Gruman et al., 2010). Additionally, we were able to extend the research on mobility to a Latino-majority sample, whereas most of the research on school mobility has been either on Black-majority (Alexander et al., 1996; Ingersoll et al., 1989; Kerbow, 1998) or white-majority samples (Gruman et al., 2008). We also controlled for school quality the year before their school move in the multivariate analyses, allowing us to see what variables remain significant after accounting for moves from high and low quality schools. We also provide a number of relevant predictors for consideration for future researchers interested in the outcomes associated with school mobility.

There are some important limitations to this study, however. First, we only have data from children in one city/county of the United States, however this is a common limitation (Alexander et al., 1996; Gruman et al., 2008; Ingersoll et al., 1989) due to the fact that mobility data across school districts may be reported differently. Another limitation comes from the inclusion of only on-time students in K-G5 -- those who skipped or were retained a grade may also move schools, and their inclusion in future research will help better understand the overall pattern of school mobility. This is a common limitation with the research in this field, however, and I opted to limit the sample to on-time students to be able to compare to previous research. We now need to track students on and off time to expand the school mobility research. The retained children especially may be at a greater risk of environmental instability, including a lack of stability in school setting. Finally, our measure of school mobility was limited to whether or not they moved at all each school year, we do not have information about the frequency of school moves within years, so our dependent variable has a limited range of 0-5. This potentially underestimates the total number of times some students moved between K-G5.

Looking forward, future research can incorporate many of the approaches found in this thesis to explore additional predictors and possible outcomes of school mobility in the same dataset and in other regions of the US where a longitudinal design has been employed. Policy makers and practitioners need sound research to help shape approaches to make children's lives less chaotic overall. Even something as simple as offering public transportation to stay at the same school for students who move residences within the same school district might help reduce the chaos of switching schools. Getting a clearer picture of school mobility can help with that by identifying what patterns of mobility appear to be particularly risky, and to identify ways that may help reduce negative impacts from such school moves. Buddy systems with peers at the target school could be a viable option for children who end up moving schools. Completely eliminating school mobility is not reasonable, as sometimes there are advantages of a school move, like better school quality, resources for individual needs, or allowing the parent to take a better job, which may outweigh some temporary instability. We are suggesting that the process of school mobility be looked at closer in order for the community (i.e. – schools, families, teachers, and administrators) to respond timely to changes in a child's school setting when needed.

TABLES

Table 1. Bivariate analysis of school mobility by grade, number of moves, and time of first move

Grade Transition	*N* of Movers/ Total *N*	% Students Moved
K-G1	4,104 / 28,055	14.60%
G1-G2	3,928 / 29,287	13.40%
G2-G3	3,777 / 28,457	13.30%
G3-G4	3,549 / 27,199	13.00%
G4-G5	2,341 / 25,439	9.20%
Total Ever Moved K-5	12,492/33,043	37.80%
Total Moved All of K-5	8,102/20,806	38.90%
Number of Moves	**Number of students (*N=33,043)***	**% of Students Moved**
0	20,551	62.20%
1	8,663	26.20%
2	2,867	8.70%
3	781	2.40%
4	165	0.50%
5	16	.005%
Time of First Move	**Number of Students**	**% of Students Moved**
K-G1	4,104	17.7%
G1-G2	2,472	10.6%
G2-G3	1,899	8.2%
G3-G4	1,382	5.9%
G4-G5	690	3%
Never moved	12,704	54.6%
Total	23,251	100%

.

Table 2. Mean scores on school readiness: School mobility vs. no school mobility

School Readiness Assessment	*N* (Mobility)	M (Mobility)	*(SD)*	*N* (No Mobility)	M (No Mobility)	*(SD)*	Cohen's d
TeacherDECA							
Attachment	10,303	50.98***	(27.93)	17,286	53.07***	(28.27)	0.07
Self-Control	10,303	65.21***	(27.70)	17,286	69.37***	(26.2)1	0.16
Initiative	10,303	59.20***	(28.33)	17286	61.23***	(28.41)	0.07
TPF	10,303	57.74***	(27.96)	17,286	60.84***	(27.79)	0.11
Behavior Concerns	10,303	48.93***	(29.56)	17,286	44.12***	(29.20)	0.16
Parent DECA							
Attachment	9,474	38.62***	(30.82)	16,297	41.15***	(30.74)	0.08
Self-Control	9,474	61.12***	(30.00)	16,297	64.16***	(28.50)	0.10
Initiative	9,474	52.85***	(30.70)	16,297	54.40***	(30.15)	0.05
TPF	9,474	50.00***	(31.43)	16,297	52.62***	(30.54)	0.08
Behavior Concerns	9,474	68.61***	(28.66)	16,297	65.64***	(29.39)	0.10
LAP-D							
Gross Motor	6,624	68.35	(28.82)	11,413	68.23	(28.65)	0.00
Fine Motor	7,593	55.57***	(28.74)	12,681	59.07***	(28.33)	0.12
Cognitive	7,596	50.87***	(29.69)	12,658	55.52***	(30.23)	0.15
Language	7,559	43.44***	(30.12)	12,610	47.2***	(30.94)	0.12

****p or welch < .001

Table 3. Bivariate correlations of DECA and LAPD scores with total number of moves

DECA and LAPD Correlations with Total Number of Moves

	Total Number of Moves K-5
Total Number of Moves K-5	1
Teacher DECA	
Attachment	-0.047**
Self Control	-0.065**
Initiative	-0.31*
Total Protective Factor	-0.055**
Behavior Concerns	0.067**
Parent DECA	
Attachment	-0.030*
Self Control	-0.031*
Initiative	-0.032*
Total Protective Factor	-0.033**
Behavior Concerns	0.026*
LAP-D	
Gross Motor Skills	0.025
Fine Motor Skills	-0.063*
Cognition	-.039**
Language	-0.035*

Note. Only students who moved (*n* = 12,492) were included in above analyses.

**p < .01, *p < .05

Table 4. Bivariate analysis of school mobility by ethnicity, center type, primary exceptionality, and gender

Variable	*N* of movers/Total *N*	% Movers K-5
Ethnicity		
Black	5,267/11,361	46.4%***
Latino	6,609/19,197	34.4%***
White, Asian, Other	604/2,388	25.3%***
Free/Reduced Lunch		
Yes	8,691/21,509	40.4%***
No	1,691/6,227	26.9%***
Center Type		
Center-based & Family Daycare	4,445/10,626	41.8%***
Public School Pre-K	6,945/20,097	34.6%***
Primary exceptionality in G1		
No	10,093/25,933	38.9%***
Yes	1,956/5,655	34.6%***
Gender		
Male	6,420/16,985	37.8%
Female	6,064/15,977	38.0%
School Quality Pre Move		
A	4,541/12,608	36.0%***
B	1,660/3,523	47.1%***
C	2,769/4,912	56.4%***
D	708/1,137	62.3%***
F	225/316	71.2%***

***p < .001

Table 5. Standardized Poisson regression on binary and count occurences of school mobility

	School Mobility Y/N				School Mobility Count		
Variable	exp. *b*	*B* Log	*S.E.* (log)	*p* (log)	*B* Poisson	*S.E.* (poisson)	*p* (poisson)
Female	1.01	0.019	0.031	0.531	-0.003	0.056	0.952
Subsidized Childcare	0.91	-0.085*	0.036	0.017	0.218***	0.059	0.000
Special Education in G1	0.92	-0.075*	0.037	0.044	-0.225***	0.059	0.000
White	1.04	0.048	0.030	0.109	-0.226**	0.075	0.003
Latino	0.94	-0.061	0.035	0.086	-0.430***	0.060	0.000
Parent TPF DECA	1.02	0.029	0.031	0.346	-0.007	0.059	0.910
Teacher TPF DECA	0.98	-0.019	0.044	0.672	-0.120	0.076	0.114
Teacher BC DECA	0.91	-0.099*	0.041	0.015	0.102	0.072	0.161
Cognitive LAP-D	1.05	0.057	0.045	0.197	-0.079	0.077	0.303
Free/Reduced Lunch	0.99	-0.009	0.031	0.764	0.347***	0.061	0.000
Pre-Move School Quality	1.23	0.212***	0.035	0.000	-0.323***	0.054	0.000

***p < .001, **p < .01, *p < .05

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