

Alternative Approach: Assessing the Impact of HUD's Assisted Housing Programs on Educational Opportunity and Well-being

Assisted Housing
Research Cadre Report



PD&R



Alternative Approach: Assessing the Impact of HUD's Assisted Housing Programs on Educational Opportunity and Well-being

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DISCLAIMER

The contents of this report are the views of the contractor and do not necessarily reflect the views or policies of the U.S. Department of Housing and Urban Development or the U.S. Government.

Preface

Alternative Approach: Assessing the Impact of HUD's Assisted Housing Programs on Educational Opportunity and Well-being provides an alternative approach to measuring educational opportunity for use in promoting the well-being of children served by HUD's assisted housing programs. The original approach links children's assisted housing data from HUD with education data available through the Department of Education. These data are aggregated at the school level. This approach has problems that limit the precision and accuracy of measuring educational opportunity.

An alternative approach is needed because education data at the school level does not show the child's actual school of enrollment nor the individual child's educational outcomes. Measuring educational opportunity in this manner is questionable because it assumes that proximity to a high performing school equals attendance at that school, and that proximity to a high performing school would equate to improved educational outcomes for children. Without individual-level educational records, these assumptions cannot be tested.

This report presents a literature review of the associations between HUD assisted housing programs and children's educational well-being. It provides information about the research examining assisted housing and educational well-being, which educational outcomes are most or least benefited by assisted housing programs, and ways in which the alternative approach can improve upon the data quality, methodology, and analysis of previous research.

Researchers scanned available public-use data sets to ascertain whether they would be useful for developing the alternative measures of educational opportunity and well-being at the individual level, or if these data could be linked to HUD's housing data. The researchers found a lack of public-use data sets with reliable individual-level housing linked to education data.

The report concludes that using data at the individual level provides a framework for developing precise and accurate measures of educational opportunity and well-being for children in HUD's assisted housing programs. The report discusses how the proposed alternative approach would use integrated administrative data systems to link individual-level HUD and education data. The researchers propose a study based on the linkage of individual-level student records with assisted housing records to ascertain how children in assisted households fare in terms of academic achievement, educational attainment, and behavioral adjustment, as compared to similar children who do not reside in assisted housing. Three locations—Pittsburgh, Pennsylvania; the State of South Carolina; and the State of Michigan—were identified as having both housing and educational data that are needed for such a study or having real potential to acquire it for their integrated database systems.

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Executive Summary

The purpose of this report is to provide an alternative approach to measuring educational opportunity for all children being served by The United States Department of Housing and Urban Development's (HUD) assisted housing programs that can be used nationally to promote these children's educational well-being. This alternative approach was developed to improve the precision and accuracy of HUD's original approach to measuring educational opportunity (access to high quality schools) and well-being (children's successful academic and behavioral progress) for students in assisted housing. The original approach links children's assisted housing data from HUD with education data available through the Department of Education aggregated at the school level. Because education data are only available at the school level for the original approach, it is impossible to determine the child's actual school of enrollment and the child's individual educational outcomes. This measure of educational opportunity would be substantially limited because it assumes that (a) proximity to a high performing school equals attendance at that school, and (b) this proximity to a high performing school would equate to improved educational outcomes for children. Without individual-level educational records, these assumptions cannot be tested. The alternative approach presented in this report provides a framework for developing more precise and accurate measures of educational opportunity and well-being for children in HUD's assisted housing programs using data at the individual level. There is currently no consensus in the education field regarding how to best measure school quality to inform children's educational opportunity. The alternative approach also provides a recommended strategy for improving upon current school quality measures that depend primarily upon average standardized achievement test scores in each school.

This report consists of three sections. First, a literature review of the associations between HUD assisted housing programs and children's educational well-being is presented in Chapter One. This literature review provides information about the current state of research examining assisted housing and educational well-being, which educational outcomes are most or least benefited by assisted housing programs, and ways in which the alternative approach can improve upon the data quality, methodology, and analysis of previous research. The second section presented in Chapter Two is a scan of available public-use data sets to ascertain whether they would be useful for developing the alternative measures of educational opportunity and well-being at the individual level, or if these data could be linked to HUD's housing data. Finally, Chapter Three presents how the alternative approach utilizes a unique network of integrated administrative data systems to link individual-level HUD and education data. The core information from each of these chapters is presented below.

Literature Review

The review of the literature examining the relations between housing assistance programs and student educational outcomes resulted in the following findings organized by educational well-being domain:

- **Academic Achievement:** There were no demonstrated improvements in high-school graduation, college attendance, or school mobility among children from non-assisted housing in the population-based observational studies. More rigorous experimental voucher-evaluation studies demonstrated that there was no significant benefit of housing voucher programs for academic achievement outcomes. However, findings suggest that subgroups of children from the voucher families, including African Americans, elementary-age students, and adolescent boys, may have improved achievement tests.
- **Educational Attainment:** A majority of the population-based observational studies as well as the experimental voucher studies showed no significant improvements for educational attainment among children in assisted housing programs; however there were some demonstrated effects in three studies. One population-based observational study showed that students in public housing were less

likely to be retained a grade as compared to other low-income children. Students in the HOPE VI voucher program demonstrated fewer cases of dropping out of high school, and in the multi-city Moving to Opportunity (MTO) voucher demonstration, only the students in the Baltimore sites were less likely to repeat a grade.

- **Behavioral Adjustment:** Students in the HOPE VI relocation program experienced fewer behavior problems at follow up and students of families receiving MTO vouchers in Boston experienced fewer disciplinary actions. Otherwise, the population-based observational studies and the voucher programs showed no significant improvement in reduced suspensions, classroom behavior, or attendance rates.
- **School Mobility and School Quality:** Only one population-based observational study examined school quality and mobility. It found that students in public housing were no more likely to attend a high-quality school, but they were significantly less likely to change schools. The voucher intervention programs, though designed to increase residential mobility among participants, did not demonstrate any greater increase in school mobility. The MTO voucher program demonstrated even greater success, showing significant benefits in preventing school mobility, and students of voucher families gained significantly greater access to high performing schools.

This literature review identified the following ways in which the data quality and study methodology could be improved in future research examining the associations between assisted housing programs and children's educational opportunity and well-being.

- **Comparison groups of children:** Population-based observational studies could be improved if the delineation between housing status types were more refined. For instance, studies examining the range of student educational outcomes for students across specific housing types (for example, public, privately-owned subsidized, LIHTC, low-income non-assisted, and homeless) would provide enriched information as to the relative contributions of the HUD-funded housing assistance programs. In particular, little information is available to compare educational outcomes of children in particular assisted housing programs to homeless children, which may be a relevant comparison.
- **Measurement selection:** Researchers studying housing program effects on student educational attainment or behavioral adjustment need to carefully consider the measurement choices for these important student outcomes. Reliance on parent- or self-reported answers to survey questions are much less reliable than reliance on reports from individuals observing children in the school (such as teachers) or data from school administrative records. School quality constructs need to include a more comprehensive set of indicators than simply the averaged standardized test scores for a school.
- **Access to quality schools and reduced school mobility:** The majority of the reviewed studies did not control for the quality of the school children were attending when examining the associations between housing programs and student educational well-being. However, one of the few studies that did examine school quality found a significant improvement in access to high-performing schools among students of voucher families. Previous research has demonstrated that students who change schools, particularly at a young age, are at greater risk for school dropout, lowered academic achievement, and poor behavioral adjustment to school. The promise of these voucher programs to reduce the likelihood of school moves may have long-term impacts on these important educational outcomes for children. Future research should examine the independent and interactive effects of these two factors to better determine whether the disruption of the move is worthwhile if it is to a greater quality school.

Scan of Public Use Data Sets for Housing and Education Data

A scan was conducted of public-use data sets to determine whether they contain the important individual-level housing and education data that were found in the literature review to be important for inclusion in future research. Four public-use data sets met these criteria. The resulting data sets include the National Longitudinal Study of Adolescent Health, the Fragile Families and Child Well-Being Study, the National Longitudinal Survey of Youth 1997 Cohort, and the Panel Study of Income Dynamics Child Development Supplement. Each of the four available public-use data sets provides at least one measure of housing assistance or homelessness and at least one measure of educational well-being. However, these available data had the following substantial limitations that do not allow for comprehensive analysis of the individual-level associations between housing assistance programs, homelessness, and student educational well-being:

- **Source of key variables:** The housing and homelessness variables in all studies were obtained through either self or primary caregiver reports, which are often unreliable sources because individuals are often hesitant to express honesty about negative life events such as inadequate financial means to obtain housing for themselves or their families. The only academic achievement and school mobility data obtained at multiple time points in these data sets were parent or self reports, again limiting the reliability of these variables. Behavioral adjustment indicators in all four studies were shortened versions of otherwise validated measures (concerns with this are discussed in Chapter 2) or measures that were developed for the study itself, with no foundational information about their reliability or validity.
- **Housing program not defined:** The housing assistance variable does not differentiate public housing from privately-owned subsidized housing or housing vouchers. This limits potential comparisons of housing assistance programs.
- **Inconsistent across time:** Housing and educational well-being data were not consistently recorded across all waves of data collection in each study, limiting the ability to conduct sophisticated longitudinal analyses of housing effects on educational well-being. Three of the four data sets did collect teacher or school records of academic achievement, however these were only available at one time point in each data set, preventing any longitudinal analysis.

The review of these available public-use data sets stresses the need for reliable and consistent longitudinal population-based data for the examination of the association of housing assistance programs and student educational well-being.

Proposed Integrated Data Systems (IDS)-based Study to Assess Educational Opportunity and Educational Well-being of Assisted Housing Residents

Due to the lack of public-use data sets with reliable individual-level housing and education data, this report recommends a study based on the linkage of individual-level student records with assisted housing records to ascertain how children in assisted households fare in terms of academic achievement, educational attainment, and behavioral adjustment, as compared to comparison children who do not reside in assisted housing. As state-based systems for these types of data are implemented over the next 2-3 years, the opportunity will emerge for HUD and its partners to reach data exchange agreements with state educational authorities and create national measures. The research questions in this report are in response to important needs raised in the literature review.

1. Is assisted housing status associated with better educational outcomes?
2. Are the associations between assisted housing status and educational outcomes mediated by
 - a. residential instability;
 - b. school mobility;
 - c. better neighborhood quality; or
 - d. better school quality?
3. Is assisted housing status associated with better neighborhood quality over time?
4. Is assisted housing status associated with better school quality over time?

A network of 3 locations—Pittsburgh, Pennsylvania; the State of South Carolina; and the State of Michigan—have been identified as having both housing and educational data or having real potential to acquire it for their integrated database systems. After identifying these sites for inclusion in this project, we surveyed them further to determine their specific housing and educational data sources and data elements of the project.

A study examining the associations between homelessness, school mobility, and educational well-being of young children in one of the Network sites is presented in Appendix B. This study demonstrates the feasibility of linking housing and education data for entire cohorts of children using this network.

Potential Implications

The recommended study could generate knowledge about the impact of HUD's assisted housing programs on educational outcomes, access to educational opportunities, and neighborhood quality. The presence and size of positive impacts associated with assisted housing programs (by type) could potentially influence public support for these programs. The extent to which these differences are mediated by residential instability and school instability could provide evidence showing whether housing assistance is a critical, stabilizing factor to improving student educational opportunities and achievement. Such a result would support HUD's FY 2010-2015 Strategic Plan, the third goal of which is to "utilize housing as a platform for improving quality of life," noting that "stable housing, made possible with HUD support, provides an ideal platform for delivering a wide variety of health and social services to improve health, education, and economic outcomes." Indeed, one of the subgoals is to "utilize HUD assistance to improve educational outcomes and early childhood development." Thus, this study has the potential to provide evidence regarding the degree to which HUD's housing assistance programs meet these goals, and how to improve its programs to do so, either by enabling greater access to better neighborhoods and schools, or through promoting greater residential and school mobility.

Introduction

The purpose of this report is to provide an alternative approach to measuring educational opportunity that can be used nationally to promote the well-being of all children being served by HUD's assisted housing programs. This alternative approach was developed to improve the precision and accuracy of HUD's original approach to measuring educational opportunity and well-being for students in assisted housing. The original approach links children's assisted housing data from HUD with education data available through the Department of Education aggregated at the school level. Because education data are only available at the school level for the original approach, it is impossible to determine the child's actual school of enrollment and the child's individual educational outcomes. This measure of educational opportunity would be substantially limited because it assumes that (a) proximity to a high performing school equals attendance at that school, and (b) this proximity to a high performing school would equate to improved educational outcomes for children. Without individual-level educational records, these assumptions cannot be tested. The alternative approach presented in this report provides a framework for developing more precise and accurate measures of educational opportunity and well-being for children in HUD's assisted housing programs using data at the individual level.

This report consists of three sections. The first is a literature review of the associations between HUD assisted housing programs and children's educational well-being is presented in Chapter One. This literature review provides information about the current state of research examining assisted housing and educational well-being, which educational outcomes are most or least benefited by assisted housing programs, and ways in which the alternative approach can improve upon the data quality, methodology, and analysis of previous research. The second section, presented in Chapter Two, is a scan of available public-use data sets to ascertain whether they would be useful for developing the alternative measures of educational opportunity and well-being at the individual level, or if these data could be linked to HUD's housing data. Finally, Chapter Three, the third section, presents how the alternative approach utilizes a unique network of integrated administrative data systems to link individual-level HUD and education data. This alternative approach could (a) provide the most precise and accurate measures of educational opportunity and well-being for children in HUD's assisted housing programs and (b) use these measures to answer important questions about the associations between HUD assisted housing programs and children's educational opportunity and well-being. The comprehensive strategy of the alternative approach would provide HUD with more precise and accurate information for improving the educational opportunity and well-being of children living in assisted housing programs.

CHAPTER 1: Literature Review of Housing Assistance Programs and Student Educational Well-being

The importance of supportive environmental and social contexts to children's positive development has been a source of much study in social science research. These studies are primarily grounded in the *ecological systems theory* of human development first posed by Bronfenbrenner (1979) which recognizes that children's growth and development is influenced by multiple systems in which children are embedded, with the most proximal one being the home environment. Research has consistently found that enriched experiences in the home environment have the ability to greatly improve children's cognitive and social-emotional well-being, particularly among low-income families, (Bradley, 2002; Hart & Risley, 1995; Shonkoff & Phillips, 2000).

Characteristics of the home environment play a role in promoting or hindering the healthy development of children of all ages. A recent review by Leventhal and Newman (2010) found that among low-income families who do not have the financial means to access high-quality housing, children's health, cognitive, and social-emotional development were negatively related to poor housing conditions (Krieger & Higgins, 2002; Dilworth-Bart & Moore, 2006), crowded housing (Conley, 2001; Maxwell, 1996), and housing mobility (Astone & McLanahan 1994; Adam & Chase-Lansdale, 2002). Furthermore homelessness, the most extreme form of housing distress, has been shown to have deleterious effects on important educational outcomes that have implications for future employment and self-sufficiency, including academic achievement, attendance, behavioral adjustment, and school attendance (reviewed in Buckner, 2007).

These findings on the relationship between stable high-quality housing and children's educational well-being stress the importance of programs designed to alleviate the housing burdens faced by low-income families. The purpose of this review is to synthesize the literature examining the associations between existing assisted housing programs for low-income families and student educational well-being (i.e., success in the areas of achievement, educational attainment, behavioral adjustment), school mobility, and educational opportunity (i.e., access to high quality schools). A careful consideration of this research can pinpoint ways in which future research can be improved to provide more reliable information about housing program effectiveness for student educational well-being.

Review Methodology

Studies for this review were identified using online electronic databases as well as government sources and organizations responsible for the large-scale housing voucher evaluations. Online databases included Education Index, ERIC, PsychINFO, PubMed, Academic Search Premier, Social Services Abstracts, Sociological Abstracts, EBSCO MegaFILE, Urban Studies Abstracts, and Family and Society Studies. This search is limited to studies conducted in the United States within the last 20 years with participating children enrolled in pre-kindergarten through high school. This search identified in two literature review articles and 21 empirical research studies. The empirical research studies were further analyzed to ensure they (a) examined associations at the individual student level rather than at the school level and (b) compared students in assisted housing programs to comparable non-assisted peers such as otherwise eligible low-income families. Fifteen of the empirical studies met these criteria, three being population-based observational studies of comparison and twelve evaluating the effects of specific housing assistance program interventions on students' educational well-being (studies are separated according to their status of population-based or intervention evaluations in the reference section).

To ensure that the definitions of housing assistance programs are clearly differentiated, the following provides a brief description of the delineation between the U.S. Department of Housing and Urban Development (HUD) housing programs that will be used in this literature review.

Public housing

Public housing encompasses government-operated properties that offer reduced rental rates to low-income families. These properties are federally funded by HUD through local public housing agencies (PHAs) and these PHAs manage the rental properties. Families are deemed eligible based on their income level relative to the median income in the local county or metropolitan area. Families are considered lower-income eligible if their income relative to the area is between 50% and 80%, and families qualify as very low-income eligible if their relative income is less than 50% of the area median. Public housing is becoming less prevalent because through its very design low-income families are concentrated in poverty-stricken neighborhoods, and this maintains neighborhood segregation by income level (Mitchell, 1985).

Privately-owned subsidized housing developments

Privately-owned subsidized housing developments are financed with federal subsidies, but are owned and managed by private rental property owners. These private owners provide reduced rental rates to eligible low-income tenants. For decades, HUD has contracted with subsidized multifamily property owners to provide even deeper project-based assistance, similar to public housing. Assisted multifamily programs operate directly through Section 8 and similar contracts with owners, as well as indirectly through Section 8 Mod Rehab contracts administered by PHAs.

The largest current low-income housing production program is the Low-Income Housing Tax Credit (LIHTC) Program, which provides income tax credits to private property investors if they make a percentage of units available to eligible low-income families. LIHTC and other affordable, or nearly affordable, private developments often house very low-income tenants who have tenant-based assistance (for example, vouchers).

Tenant vouchers

Federal housing assistance has been slowly transitioning from public housing and private project-based assistance to tenant-based assistance because of perceptions of lower costs and greater potential mobility of eligible families to less income-segregated neighborhoods. Like public housing, most voucher programs are funded federally and operated by local PHAs.

Tenant voucher programs provide eligible very low-income families with vouchers to rent private-sector housing. These vouchers are designed to allow for even greater flexibility than the LIHTC options in assisting families to find housing outside of their impoverished communities. When tenants provide a voucher to the property owner, the rent exceeding 30% of the family's income typically is paid for by the PHA.

Voucher Intervention Programs

The *Gautreaux* voucher program in Chicago (1976-1990) and its evaluation provided evidence for the benefits of voucher programs. The *Gautreaux* program demonstrated that when impoverished families were given the opportunity to move into less economically segregated neighborhoods, most notably suburban communities, parents and children fared significantly better in economic improvement and criminal activity as compared to families who remained (Rubinowitz & Rosenbaum, 2000). In light of this success, four notable housing voucher programs were implemented in the last two decades. They were evaluated with greater rigor than the *Gautreaux* program such that participating families were randomly assigned to receive the vouchers and data were collected on children's educational success (reviewed in Deluca & Dayton, 2009).

The *HOPE VI* relocation program began in Chicago in 1996 and was designed to improve housing and neighborhood quality by decentralizing poverty and providing housing options in safer and less impoverished neighborhoods. Over 57,000 public housing units were demolished, and residents in these units were given vouchers to relocate within the city. By 2005, roughly half of the voucher recipients moved to privately-owned subsidized housing, 15 percent moved to alternative public housing, and the rest remained in the original housing units waiting to relocate (Gallagher & Bajaj, 2007).

The *Moving to Opportunity* (MTO) program began in 1994 in New York, Boston, Baltimore, Chicago, and Los Angeles, where public housing residents were eligible to enter a voucher lottery to relocate to privately-owned subsidized housing units. These families were designated to one of three housing groups: (a) restricted vouchers which could be used in census tracts with poverty rates less than 10 percent, (b) unrestricted vouchers to move to any neighborhood in their city, or (c) voucher nonrecipients who remained in their public housing units (Orr, et. al, 2003). The *Yonkers Family and Community Project* was implemented in 1992 in response to the court ruling that New York City public housing was racially segregating poor families, and 200 new subsidized housing developments were constructed in the mostly-white communities of Yonkers (Fauth, Leventhal, & Brooks-Gunn, 2004). Families living in public housing who applied for the voucher program were randomly selected for receipt of a voucher and compared with a group of nonrecipients comprising families who remained in the old public housing units and who volunteered to participate in the study, about half of whom originally applied for the voucher program (Fauth, et. al, 2004).

The *Welfare to Work Voucher* (WtWV) program was initiated as part of the overall Welfare to Work efforts to promote self-sufficiency among eligible low-income families. These welfare families were randomly assigned to (a) receive vouchers for relocation or (b) the control group (Abt Associates, 2006). Available findings regarding the associations between each of these four voucher interventions and student educational outcomes will be reviewed in the following section.

Review of Housing Programs and Student Educational Well-being

Findings from these studies are organized here by domains of student educational outcomes, including academic achievement (reading and math skills and grade point average), educational attainment (graduation status, college attendance, grade retention, and dropout status), and behavioral adjustment (suspension, disciplinary action, classroom behavior, and attendance).

Academic achievement

Studies examining the relations between assisted housing programs and student academic achievement are surprisingly limited. There are no available population-based observational studies that meet the inclusion criterion of comparing children in public housing to a comparison group of otherwise non-assisted children from low-income families. Three of the four voucher intervention programs did provide results regarding at least one academic outcome and these findings are mixed, primarily with insignificant or moderately negative effects of the voucher programs. Results from the HOPE VI program indicate that children of families receiving the voucher support in elementary through high school did not fare better than their counterpart families three years after program implementation on reading and math achievement test growth or, for high school, overall grade-point average (Jacob, 2004). Findings from the seven-year follow up of the Yonkers Family and Community Project also found that students of all age groups in the voucher program did not demonstrate significantly larger gains in reading and math achievement tests compared to students remaining in the segregated public housing units (Fauth, Leventhal, & Brooks-Gunn, 2007). Among the high school students, those of voucher families reported significantly worse academic success than students of families in the original public housing projects (Fauth, et. al, 2007).

Findings from the MTO voucher program are not dissimilar; however, subgroup analyses were performed with mixed results. For students in elementary through high school, results from each follow-up (four to seven years) indicate that students of either restricted or unrestricted voucher families did not perform significantly higher than families who remained in public housing on reading and math standardized achievement tests (Sanbonmatsu, Kling, Duncan, & Brooks-Gunn, 2006; Orr, et. al, 2003). However, these results were not consistent across subgroups of children. For instance, middle and high-school students in the voucher program in New York City demonstrated lower grade-point averages than their counterparts (Leventhal, Fauth, & Brooks-Gunn, 2005). Children in the Baltimore site who were in elementary school at the time of the move demonstrated significantly better reading at the first follow up (Ludwig, Ladd, & Duncan, 2001), but these findings diminished to non-significance by the second follow-up period (Sanbonmatsu et. al, 2006). Also in the Baltimore site, among African American families, voucher children performed significantly better on standardized achievement tests for reading compared to children remaining in public housing (Sanbonmatsu et. al, 2006). Further analysis revealed that adolescent boys across all sites whose families received the restricted voucher demonstrated higher reading and math achievement test scores compared to public housing adolescent boys (Leventhal & Brooks-Gunn, 2004). However, this story reversed for children of families who received the unrestricted voucher. Adolescent boys in the unrestricted voucher families in New York City performed worse on reading achievement tests and adolescent girls whose families received unrestricted vouchers performed worse on math achievement tests than public housing children (Leventhal, et. al, 2005).

Educational attainment

The three population-based observational studies examined at least one of these educational attainment indicators for elementary through high-school students, comparing students living in public housing to those in privately-owned subsidized housing or otherwise non-assisted children from low-income families (Aratani, 2010; Newman & Harkness, 2000; Currie & Yelowitz, 2000). It was found that students in public housing did not demonstrate greater likelihood of graduation or college attendance than students from non-assisted low-income families (Newman & Harkness, 2000). The same results were found when comparing students from public housing to those in privately-owned subsidized housing (Aratani, 2010). Currie & Yelowitz (2000) also examined grade retention and found that, overall, students in public housing were less likely to be held back than students from other low-income households, and these results were particularly pronounced for African American students.

Among the voucher intervention programs, results were again mixed. Follow-up findings from the HOPE VI program demonstrate that relocated high-school students were less likely to drop out of school than students who remained in the original public housing units (Jacob, 2004). Results from the MTO evaluation show that, among all age groups, students whose families received either the restricted or unrestricted vouchers were no less likely to report having repeated a grade (Sanbonmatsu et al., 2006; Leventhal & Brooks-Gunn, 2004). Students of the MTO voucher program also did not demonstrate any reduction in self-reported rates of school dropout (Ludwig, et. al, 2001). However, Ludwig and colleagues (2001) found that, among students in Baltimore, adolescents of voucher families were less likely to report having repeated a grade. The WtWV program did not show significant benefits for parent-reported high-school completion, college attendance, or grade retention. However, elementary school children of voucher families were significantly less likely to be kept out of school by their primary guardian due to health, financial, or disciplinary problems (Abt Associates, 2006).

Behavioral adjustment

None of the population-based observational studies examined behavioral adjustment outcomes for students. Each of the four voucher intervention programs examined at least one school-related behavioral outcome, including likelihood of experiencing suspensions and disciplinary action, performance on

classroom behavior assessments, and attendance rates. Parents in the HOPE VI voucher program reported that their children experienced fewer behavior problems after relocation, particularly among girls, while parents of children living in the original public housing units did not report any decrease in their children's problem behaviors (Gallagher & Bajaj, 2007). However, no improvement was found for classroom engagement (Gallagher & Bajaj, 2007) and there was no significant difference found in attendance rates when comparing relocated students and those remaining in the original public housing units (Jacob, 2004). The WtWV program also found no beneficial improvements of parent-reported behavioral problems for relocated students (Abt Associates, 2006). The Yonkers Family and Community Project only examined one behavioral adjustment outcome for students, self-reported behavior problems, and found that young students of voucher families reported fewer behavior problems than young students who remained in public housing. In contrast, high-school students who relocated reported significantly *more* behavior problems than students who remained in public housing (Fauth, et. al, 2005).

The MTO program also demonstrated few improvements for student behavioral adjustment outcomes, and those that were found significant were site-or subgroup-specific. Students whose families participated in the MTO, in either the restricted or unrestricted voucher programs, did not experience fewer suspensions than the public housing students as reported by parents (Sanbonmatsu, et. al, 2006; Leventhal & Brooks-Gunn, 2004). MTO results for disciplinary action varied by site, with parents of students in the Boston MTO voucher program reporting fewer disciplinary cases than parents of public housing peers (Katz, Kling, & Liebman, 2001), while students in the Baltimore MTO voucher program did not have any significant lessening of parent-reported disciplinary action as compared to the non-voucher students (Ludwig, et. al, 2001). Parent-reported behavior problems for all students showed that the MTO voucher program had no beneficial impact (Orr, et. al, 2003), though adolescent boys who relocated through the MTO program were more likely to report more behavior problems as compared to students who remained in their original public-housing units (Orr, et. al, 2003; Sanbonmatsu, et. al, 2006). Finally, MTO program effects on parent-reported school attendance rates were only examined in Baltimore and no significant improvement was found (Ludwig et. al, 2001).

School mobility and access to high-quality schools

Though relatively understudied compared to other student outcomes, the few studies on housing programs have more consistent findings on their associations with students' educational opportunity (i.e., access to high-quality schools) and rates of school mobility (i.e., enrollment in a new school). The population-based observational study conducted by Currie and Yelowitz (2000) found that students in public housing were no more likely to attend a high-quality school, however they were significantly less likely to change schools. The voucher intervention programs, though designed to increase residential mobility among participants, did not demonstrate any greater increase in school mobility. Students of voucher families in the HOPE VI program did not change schools any more than students who remained in the original public housing units (Jacob, 2004). The MTO voucher program demonstrated even greater success, showing (a) significant benefits in preventing school mobility (Sanbonmatsu, et. al, 2006) and (b) that students of voucher families who did move gained significantly greater access to high performing schools (Orr, et. al, 2003; Deluca & Rosenblatt, 2010).

Summary of findings

The review of the literature examining the relations between housing assistance programs and student educational outcomes at first glance is disheartening. The population-based observational studies of students in public housing or privately-owned subsidized housing, compared to other low-income students, did not demonstrate any substantial improvements in high-school graduation, college attendance, or school mobility, though students in public housing were less likely to be retained a grade than other low-income children from non-assisted housing. More rigorous experimental results examining

the benefits of the HOPE VI, MTO, WtWV, and Yonkers Family and Community Project voucher programs also had mixed findings. Overall results from these studies demonstrated no significant benefit of housing voucher programs for academic achievement outcomes, and in the case of the MTO program middle and high-school students demonstrated worse grade point averages. Nonetheless, there were some academic achievement benefits of the MTO program for subgroups of children on academic achievement tests, including initial follow-up test results for African American and elementary-age students in Baltimore as well as adolescent boys of families receiving the restricted voucher. Students in the HOPE VI voucher program demonstrated fewer cases of dropping out of high school, and only the students of families in the MTO Baltimore sites were less likely to repeat a grade. Results for behavioral adjustment indicators were positive in two of the evaluations, with students in the HOPE VI relocation program experiencing fewer behavior problems at follow up and students of families receiving MTO vouchers in Boston experiencing fewer disciplinary actions. Otherwise, the voucher programs demonstrated no significant improvement in reduced suspensions, classroom behavior, or attendance rates. We posit several explanations as to why these mixed results were found and suggest ways in which future research could yield more reliable information about housing program effects on student educational well-being.

Limitations to previous research

Comparison group of students

A major concern with these studies is the group of students to whom the housing program students were compared. The population-based observational studies compared either public housing students or students living in privately-owned subsidized housing to other low-income students who do not live in assisted housing. This comparison assumes that families receiving assisted housing would otherwise be capable of obtaining residence without the assistance of HUD. An alternative hypothesis is that these families are not so much similar to the other low-income non-assisted families in their neighborhoods, but rather are more similar to homeless families who are not receiving housing assistance and seek out homeless shelters for support. None of these studies have examined the comparison of educational outcomes for these three groups: public housing students, other low-income non-assisted students, and homeless students. Such research might reveal a greater effect of assisted housing as mediated by the housing crises of low-income families, and shed more light on the relative associations between assisted housing programs and student educational outcomes. There is also concern regarding the comparison groups in the HOPE VI research studies. Of the relocated families, fifteen percent of the children in the relocation group moved to alternative public housing developments and about a quarter remained in their original housing development for an extended period of time prior to relocation. By comparing this group of 'mixed housing' students to those who remained in the original public housing units, it is difficult to parse out the nature of the new housing environment and therefore draw any meaningful conclusion as to the benefits of relocation. Preferably, the relocated students could be distinguished by their new housing type and compared independently to the original public housing students.

Measurement limitations

The review of these studies raised several concerns with the chosen measures and respondents of the student outcomes in each evaluation of the housing interventions. In these intervention evaluation studies, all of the educational attainment and behavioral adjustment outcomes were collected through interviews with either the parents or the students themselves about past experiences. There is substantial concern with the reliability of data obtained through parents or students because research has shown that, when reporting on one's own experience or that of a close family member, individuals are likely to provide information that is inaccurate due to faulty memory or a desire to report more positive outcomes than they have actually experienced (Boruch, 1997). These studies would be substantially improved by utilizing a

more objective reporter for these imperative educational attainment and behavioral adjustment outcomes such as administrative school records or teacher reports of classroom behavior. Furthermore, the chosen constructs of behavioral adjustment used in these intervention evaluation studies were not validated prior to use. Rather, fewer than a dozen items were included on long parent- or self-report surveys in the interest of covering large, complex constructs of child behavior. Without previously validated measures that have been shown to (a) reliably measure these complex behavior constructs and (b) be appropriate for the population being studied, it is difficult to make concrete conclusions from the resulting effects or non-effects discovered in these evaluations of housing intervention programs.

Also, the two studies that examined the association between assisted housing and school quality used very limited indicators of school quality, including parent-ratings and average standardized achievement tests in the schools. School quality is both an important and complex construct in education. This construct has received a considerable amount of attention with increasing national mandates for accountability. While there is a clear recognition that school quality is a multidimensional construct that includes not only aggregate achievement test scores but also other school-level measures, there is no clear national consensus on these measures. One of the problems is there is a wide variety of data that are collected by school districts at the school level making it difficult to formulate a single, definitive set of school quality indicators. Typical data categories that have been identified in the literature include academic data, teacher-student ratios, curriculum and instruction information, school safety and climate for learning information, teacher and staff information, and parent involvement information. However, each state and school district differs widely in whether they have data in these categories and whether it is uniformly collected across schools. While there is a clear recognition that school quality is a multidimensional construct that includes not only aggregate achievement test scores but also other school level measures, there is no clear consensus on these measures. This makes it difficult for studies such as those reviewed here to create a consistent measure of school quality, and, therefore, to obtain meaningful and accurate results of the effects of assisted housing on access to high quality schools.

Accounting for school quality

Another concern with the reviewed studies was the lack of control for the quality of the school children were attending when examining the associations between housing programs and student educational well-being. The population-based observational studies by design did not randomize students into the housing groups being studied, so it was important to control for as many observable family and school-related differences that may exist between students in public housing, privately-owned subsidized housing, and non-assisted housing. Though extensive family and neighborhood covariates, such as student demographics, family income, parental education and employment, and neighborhood crime and poverty rates, were included in these studies none of the three included any school-level covariates. It is possible that the students in non-assisted housing attended substantially higher quality or higher-performing schools than their assisted-housing peers (or vice versa), and this could greatly affect the educational well-being of the individual students under study. Without these controls, the effects of housing program and school quality would be impossible to disentangle. The concern about school quality in the housing intervention evaluations is somewhat different. Randomization into the housing voucher group in these studies would typically allay any concerns about group differences. However, given the nature of the voucher programs to move children to new housing and, therefore, possibly to new schools, any association between the housing program and student educational well-being could be operating through changes in school quality. Only one of the housing intervention studies examined changes in school quality and found a significant improvement in school quality access for students of voucher families (Orr, et al., 2003; Deluca & Rosenblatt, 2010). This result lends support to the hypothesis that any findings of housing program effects on student educational well-being could be limited by the fact that school quality was not examined as a mediating factor. Furthermore, none of these studies addressed the fact that, while housing assistance programs may lead to greater access to high quality schools, the

disruption of the school move itself could actually be a harmful experience that counteracts the benefits of the new school environment.

Recommendations for future research

The review of the findings from these studies examining the associations between housing assistance programs and student educational outcomes suggest two proximal areas of research that would be important contributions to our understanding of the effectiveness of housing assistance programs on student success. First, population-based observational studies would be much improved if the delineation between housing status types were more refined. For instance, studies examining the range of student educational outcomes for students across specific housing types (for example, public, privately-owned subsidized, LIHTC, low-income non-assisted, and homeless) would provide enriched information as to the relative contributions of the HUD-funded housing assistance programs. Secondly, researchers with access to extended longitudinal housing and education data could examine student educational outcomes across these important housing type distinctions.

Another large improvement in this literature base would be for researchers studying housing program effects on student educational attainment or behavioral adjustment to more carefully consider the measurement choices for these important student outcomes. Reliance on parent- or self-reported answers to survey questions are much less reliable than reliance on reports from individuals observing children in the school (such as teachers) or data from school administrative records. Furthermore, any measure used with teachers would need to be evaluated prior to use for their reliability and validity for the population under study.

Perhaps the most promising findings from this review that would benefit greatly from further study are the demonstrated beneficial relations between housing assistance programs and student access to quality schools and reduced student mobility. One population-based observational study found that public housing students were less likely to change schools as compared to other low-income students. The two voucher programs that evaluated effects on school mobility found that students were either equally or less likely to change schools as compared to the students who remained in public housing. These findings have substantial merit, particularly given previous research on the negative effects of school mobility on educational outcomes. Previous research has demonstrated that students who change schools, particularly at a young age, are at greater risk for school dropout, lowered academic achievement, and poor behavioral adjustment to school (reviewed in Reynolds, Chen, & Herbers, 2009). This literature on the negative effects of school mobility, along with the promise of these voucher programs to reduce the likelihood of school moves, may have long-term impacts on these important educational outcomes for children in years to come. Also, none of these studies examined the interaction between negative effects of school mobility and positive effects of greater access to high-performing schools on educational well-being. Future research should examine the independent and interactive effects of these two factors to better determine whether the disruption of the move is worthwhile if it is to a greater quality school.

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CHAPTER 2: Scan of Public-Use Data Sets for Housing and Education Data

The purpose of this task was to conduct a scan of public-use data sets to determine whether they contain individual-level data regarding housing assistance programs, homelessness, and indicators of students' educational well-being as identified in the preceding literature review. Four public-use data sets met these criteria. The resulting data sets include the National Longitudinal Study of Adolescent Health, the Fragile Families and Child Well-Being Study, the National Longitudinal Survey of Youth 1997 Cohort, and the Panel Study of Income Dynamics Child Development Supplement. The following section provides details for each study, including (a) study design, (b) the cohort of students with complete housing and educational well-being data, (c) the nature and source reporting for housing and educational well-being variables, and (d) whether these studies included additional important variables of interest including school mobility, school quality indicators, and school-level characteristics. The housing assistance, homelessness, and residential mobility variables located in these data sets are presented in Exhibit 1 and the educational well-being variables are presented in Exhibit 2.

Public-Use Data Sets

◆ National Longitudinal Study of Adolescent Health (Add Health)

The Add Health study tracked a sample of adolescents who were in grades 7-12 from nationally representative middle and high schools in the United States beginning in 1994 (Harris, Halpern, Whitsel, Hussey, Tabor, Entzel, & Udry, 2009). The study sample participated in three in-home surveys while still in middle or high school conducted in 1994, 1996, and 2001. These surveys collected data on areas of family, community, neighborhood, school, and health-related behaviors. In the initial data collection, the primary caregiver also completed a brief survey. In 1994 and 1996, school administrators also completed surveys describing the school environment. In 2001, high-school transcripts were linked to these survey data to include information about academic performance and educational attainment. For the purposes of this data scan, variables for the roughly 5,000 participants who were ages 11-12 years in 1994 were reviewed because these students were still within the range of high-school or high-school graduation during the 2001 data collection year.

The Add Health data set includes primary caregiver and self reports of housing status. The baseline primary caregiver survey included a question about whether the family was currently living in public housing or received government assistance for rent. In the third and fourth waves of data collection, adolescents provided responses as to whether they had ever lived in a homeless shelter or on the street, and if they had made a residential move since the last interview period.

Add Health also includes the most extensive selection of educational well-being indicators of the four public-use data sets reviewed. Academic achievement indicators include standardized vocabulary assessments conducted by interviewers during each of the three waves and the student grade point average from high-school transcripts collected in the last wave only. Adolescents provided information about whether they had repeated a grade or dropped out during all three waves of data collection. These reports were cross-checked with high-school transcripts in the third wave and additional information on graduation status was obtained through these high-school transcripts. Adolescents self reported on behavioral adjustment indicators at all time points, including suspension history, ever expelled, and absenteeism.

Information was also collected on school mobility, school quality, and additional school-level characteristics. Adolescents reported whether they had changed schools since the last interview period. School administrators reported the percentage of students meeting academic proficiency on standardized achievement tests in their school as well as a range of school characteristics, including percentage of students receiving free or reduced lunch, race composition, school size, school mobility rates, and urban city of the school.

◆ **Fragile Families and Child Well-being Study (FFCWB)**

The FFCWB study follows approximately 5,000 children born between 1998 and 2000, with roughly three-quarters of the children having been born to unmarried parents (McLanahan, Garfinkel, Reichman, Teitler, Carlson, & Audigier, 2003). Interviews were conducted with mothers and fathers when the child was born and again when children were ages one, three, and five years. Additional in-home assessments of the children and their home environments were conducted at three and five years of age. Data were available for approximately 4,000 children by age five years.

Housing data were obtained during each of the four data collection periods (birth, one, three, and five years) by the primary caregiver. These data included primary caregiver reports of living in public housing or receiving government rent subsidies, whether they had been living in a homeless shelter or on the street, and how many residential moves they had made since the last interview period.

As the children were only five years of age during the most recent data collection period that is currently available for use, the educational well-being variables are limited to this year. For academic achievement, teacher ratings of children's math and reading skills were collected. Children's behavioral adjustment was assessed using an abbreviated version of a child behavior problem scale. And teachers reported on the child's grade retention.

There are no data available on school mobility, school quality, or school-level characteristics.

◆ **National Longitudinal Survey of Youth 1997 Cohort (NLSY97)**

The NLSY97 cohort study collected data on a nationally representative sample of adolescents who were born in the United States between 1980 and 1984 (Bureau of Labor Statistics, 2005). The study was designed to document the transition from school to work through annual computer-assisted interviews with respondents covering the areas of schooling, employment, family background, general expectations, attitudes, behaviors, and health. The original sample included 8,984 adolescents ages 12 to 16 years in 1997 with annual follow-up interviews occurring through 2007. For the purposes of this scan, data were included through 2004 when the children were of high-school graduation age.

All of the housing data in the NLSY97 data set were provided by the adolescent participants. They were asked each year whether they lived in public housing or received government assistance for rent. They were also asked each year whether they had moved residences since the previous data collection period. Adolescents only provided retrospective information on whether they had been homeless in the last five years during the 2002 data collection period.

The NLSY97 data do include at least one indicator of each educational domain, however these indicators were not consistently included each year. There were three separate indicators of academic achievement. First, adolescents provided reports on their grade point average each year from 1997 through 2004. Second, interviewers assessed the participants on a standardized math achievement measure from 1997 through 2001. Third, adolescents reported their most recent SAT or ACT scores between 2002 and 2004. The only annual collection of behavioral adjustment data were adolescent reports of suspension history. Finally, adolescents reported each year on three indicators of educational attainment, including grade retention, dropout, and graduation status.

Students did provide reports each year on whether they had changed schools since the previous year. However, there are no school quality variables or school-level characteristic data available in the NLSY97.

◆ **Panel Study of Income Dynamics (PSID) Child Development Supplement (CDS)**

The PSID is a nationally representative sample of men and women who were young adults in 1968. Its purpose has been to collect information on aspects of economic, demographic, sociological, and psychological behavior throughout their lives. The study continued to collect information from these

individuals each year through 1996 (Brown, Duncan & Stafford, 1996). In 1997, the study changed to biennial data collection and the CDS was implemented in which data were collected on approximately 3,600 children ages 0-12 in PSID families, including direct assessments of cognitive, behavioral, and schooling measures; teacher reports during years 1997 and 2002; and school administrator surveys in 1997 (<http://psidonline.isr.umich.edu/CDS/>). Data for this scan were obtained from PSID individual reports, CDS measures, and school administrator surveys for all school-aged children (approximately 2,500) in the study.

Primary caregivers provided all the housing data for the PSID surveys. During the three data collection periods in which the CDS data were also available (1997, 2002, 2005), primary caregivers reported as to whether they were currently living in public housing or receiving a government rent subsidy. They also reported how long they had lived in the neighborhood which could be used as an indicator of residential mobility. No data are available in any of the survey sources regarding homeless experiences.

At least one indicator of each educational well-being domain was available. Interviewers assessed children's reading, math, and memory skills through standardized assessments during each data collection period. Educational attainment data included grade retention at all time points, dropout status at the second and third time point, and graduation status only in the last time point. Teachers reported on educational attainment in the first data collection period, however parents were the source of this information in the last two waves of data collection. Behavior problems were assessed by parents at each time point, however teacher reports of behavior problems were only available in 1997 and 2002.

Absenteeism was only reported by teachers in the first two waves of data collection.

Primary caregivers also provided information at each data collection wave about the number of school changes their child had made since the last interview. No data were collected regarding school quality. In the 1997 data collection period only, school administrator surveys provided school-level characteristics, including school size, absenteeism rate, race composition, free/reduced lunch, school mobility rates, grade retention rates, student/teacher ratio, teacher degree level, teacher turnover rates, pupil expenditure, and average teacher salary.

Utility of Public-Use Data Sets for Housing and Education Research

Each of the four available public-use data sets reviewed here provides at least one measure of housing assistance or homelessness and at least one measure of educational well-being. Nonetheless, there are substantial limitations to these available data that do not allow for comprehensive analysis of the individual-level associations between housing assistance programs, homelessness, and student educational well-being.

First, the housing variables in all studies were obtained through either self or primary caregiver reports, which are often unreliable sources because individuals are often hesitant to express honesty about negative life events such as inadequate financial means to obtain housing for themselves or their families. In all studies providing homeless information, the respondents were reporting retrospectively about their homeless experiences. Therefore, these data have a greater likelihood of inaccuracy due to lost memory. Additionally, the housing assistance variable does not differentiate public housing from privately-owned subsidized housing or housing vouchers, so this limits potential comparisons of housing assistance programs. Lastly, these data were not consistently recorded across all waves of data in each study except for the FFCWB study, limiting the ability to conduct sophisticated longitudinal analyses of housing effects on educational well-being.

Second, the educational well-being indicators in each study are hindered by similar issues. Only one of the four studies, the PSID, included an entire standardized achievement measure at multiple time periods. The two other studies that conducted direct assessments of children's academic achievement used either an abbreviated version of a vocabulary measure (Add Health) or did not consistently use the same achievement measure throughout the study (NLSY97). Using shortened versions of otherwise validated measures is problematic because research has shown that the psychometric properties of the original measure cannot be assumed to be upheld (Smith, McCarthy, & Anderson, 2000). The lack of consistency

in measures across time periods also removes the ability to conduct longitudinal research that demonstrates changes in educational well-being over time due to housing status. Similar issues were found with the educational attainment and behavioral adjustment indicators. Independent reports of educational attainment (in other words, teacher and/or school records) were only available at one time period in the Add Health, FFCWB, and PSID studies. Any longitudinal indicators of educational attainment in these studies were reported by either the primary caregiver or the children themselves. The only behavior adjustment indicator in the FFCWB study was an abbreviated version of an otherwise validated measure, the Child Behavior Checklist, though the validity of this particular measure with low-income populations has been challenged (LeBoeuf, Fantuzzo, & Lopez, 2010; Gross, Fogg, Young, Ridge, Cowell, Richardson, & Sivan, 2006). The behavioral adjustment indicators for the Add Health and NLSY97 studies were entirely self-reported, and the more reliable source of reporting in the PSID study (teacher) was not available in all data collection periods.

The data available for school mobility and school quality were also scarce and plagued by similar measurement concerns. Each study, except for FFCWB, collected information about school mobility. However, similar to nearly all the other data reviewed here, these variables were either self or caregiver reports of previous school changes. Again, these data are vulnerable to inaccuracy due to memory loss. Data on the school quality where the children were enrolled are nearly nonexistent. Only one study, Add Health, collected information from school administrators about the percentage of students meeting proficiency on achievement tests. Even these data were obtained through a secondary source rather than administrative records, therefore accuracy issues are again of concern. Only one study, the PSID, provides researchers with the ability to link to school-level quality and characteristic data through the National Center for Education Statistics (NCES). These data are not currently available for linkage to the other three public-use data sets reviewed here.

As these data sets do not provide identifying information (for example, Social Security numbers, dates of birth, names), there is no possibility of linkage to any other administrative data sets with individual-level data. Therefore, these public-use data sets are limited to the flawed educational data that were originally collected. Another possibility outside of these data sets would be to link HUD's administrative data with other administrative educational data. However, this process would involve extensive navigation of privacy laws and data access requirements that may take years to achieve. NCES houses the only publicly available education data that can be integrated with HUD data, but these data include school averages of demographic characteristics, academic achievement, and graduation rates. However, the HUD data do not specify which schools children in assisted housing programs are attending. Therefore, any analysis of these data would be limited to examining the relationship between assisted housing programs and characteristics of the school closest to the children in the HUD database. Furthermore, distance to a high-performing school does not provide any means of determining the child's actual educational well-being. It does not contain individual-level student achievement data or any measures (aggregated or student-level) of social adjustment to school. Indicators of children's social adjustment to school are particularly important since the research literature indicates mixed findings regarding the association between residential instability and homelessness and subsequent social and behavioral problems in school (Buckner, 2010). Including social adjustment outcomes in this measure of educational opportunity would provide much-needed evidence for this research literature. Individual child-level measures of children's academic achievement and social adjustment to school are needed to provide a more valid determination of the educational well-being of children served by HUD programs.

The review of these available public-use data sets stresses the need for longitudinal population-based data for the examination of the association of housing assistance programs and student educational well-being, such as the data being presented in Chapter 3 of this report. The housing data in the following chapter are obtained through credible sources, such as HUD or local PHAs, and differentiated by housing assistance type (in other words, public housing, privately-owned subsidized housing, or vouchers) and homelessness for more useful comparisons. The educational data also are obtained from reliable independent school records and provide consistent academic achievement, educational attainment, and behavioral adjustment indicators across school years. Finally, school identifiers allow for the tracking of students across schools

Alternative Approach:

Assessing the Impact of HUD's Assisted Housing Programs on Educational Opportunity and Well-being

and recorded academic proficiency at the school level allows for more sophisticated and sensitive analysis of the effects of housing assistance programs on student educational well-being.

Exhibit 1: Housing Variables Available in Public-Use Data Sets

Data Source	Data Collection Year(s)	Child Age (Yrs)	Assisted Housing	Homeless	Residential Mobility
Add Health	1994	11-12	Live in public housing, Gov't aid for rent (P)		
	1996 & 2001	13-14 & 18-19		Live in shelter or on street history (C)	Number of moves since last interview (C)
FFCWB	1998-2000, 2001-2002, 2003-2004, 2005-2006	Birth, 1,3 & 5	Live in public housing, Gov't aid for rent (P)	Live in shelter or on street (P)	Number of moves since last interview (P)
NLSY	1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004	12, 13, 14, 15, 16, 17, 18 & 19	Live in public housing, Gov't aid for rent (C)		Number of moves since last interview (C)
	2002	17		Homeless past 5 years (C)	
PSID	1997, 2002, 2005	6-10, 11-15, & 14-18	Live in public housing, Gov't aid for rent (P)		How long in neighborhood (P)

(C) = Child report; (P) = Primary caregiver report.

Exhibit 2: Educational Well-Being Variables Available in Public-Use Data Sets

Data Source	Data Collection Year(s)	Child Age	Academic Achievement	Educational Attainment	Behavioral Adjustment	School Mobility	School Quality
Add Health	1994	11-12	PPVT-III Abbreviated (I)	Grade retention; Dropout (C)	Suspended; Expelled; Absenteeism (C)	School move (C)	Percent Proficient Test Scores (SA)
	1996	13-14	PPVT-III Abbreviated (I)	Grade retention; Dropout; Graduate (C)	Suspended; Expelled; Absenteeism (C)	School move (C)	Percent Proficient Test Scores (SA)
	2001	18-19	PPVT-III Abbreviated (I); GPA (SR)	Grade retention; Dropout; Graduate (SR) (C)	Suspended; Expelled; Absenteeism (C)	School move (C)	
FFCWB	2005-2006	5	Reading & Math Rating (T)	Grade retention (T)	Child Behavior Checklist - Abbreviated (T)		
NLSY97	1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004	12, 13, 14, 15, 16, 17, 18 & 19	GPA (C)	Grade retention; Dropout (C)	Suspended (C)	# of school moves (C)	
	1997, 1998, 1999, 2000, 2001	12, 13, 14, 15, 16	PIAT Math (I)				
	2002, 2003, 2004	17, 18, 19	SAT Score (C)				
PSID	1997	6-10	W-J III Reading & Math; WISC-IV Digit Span (I)	Grade retention (T)	Behavior Problem Index (T) (P); Absenteeism (T)	# of school moves (P)	
	2002	10-14	W-J III Reading & Math; WISC-IV Digit Span (I)	Grade retention; Dropout (P)	Behavior Problem Index (T) (P); Absenteeism (T)	# of school moves (P)	
	2007	15-18	W-J III Reading & Math; WISC-IV Digit Span (I)	Grade retention; Dropout; Graduate (P)	Behavior Problem Index (P)	# of school moves (P)	

Respondents: (SR) = School Records; (C) = Child; (I) = Interviewer; (P) = Primary caregiver; (SA) = School administrator; (T) = Teacher. PIAT = Peabody Individual Achievement Test (Dunn, & Markwardt, 1970); PPVT-III = Peabody Picture Vocabulary Test, Third Edition (Dunn & Dunn, 1997); WISC-IV = Wechsler Intelligence Scale for Children, Fourth Edition (Wechsler, 2003); W-J III = Woodcock Johnson Test of Achievement, Third Edition (Woodcock, McGrew, & Mather, 2001).

CHAPTER 3: Recommended IDS-based Study to Assess Educational Opportunity and Educational Well-being of Assisted Housing Residents

Rationale for IDS-based Approach to Measuring Educational Effects of Assisted Housing

For purposes of the recommended study, access to educational opportunity is conceived as one component of a broader set of measures of *educational well-being*. The concept of well-being includes not only access to satisfactorily and high-performing schools, but educational achievement and social-emotional adjustment in schools that are accessed by assisted housing residents, whether or not the schools they attend are among the highest performing. Access to quality schools can be measured by geographic proximity to such schools, as was originally suggested in HUD's task order, but such measures do not capture whether assisted household residents *actually* gain access to nearby schools. Proximity does not equal access. Moreover, aggregate measures of school performance do not establish that even if assisted households attend such high performing schools that assisted household residents experience educational achievement and social-emotional adjustment in those schools. Inferences about individual outcomes based on aggregate data are invalid because of the ecological fallacy. Alternatively, in this chapter, we recommend a study based on Integrated Data Systems (IDS) that link individual-level student records with assisted housing records to ascertain how children in assisted households fare in terms of educational attainment and adjustment, as compared to unassisted controls, on standardized tests. Three possible generalizable models of sharing housing and education data within the regulations of federal privacy laws are presented in Appendix A. We recommend to examine whether such achievement is mediated by reduced residential instability and reduced school mobility among assisted households, owing to improved housing affordability and housing choice (for voucher holders). We also believe it is important to examine whether such achievement is mediated by greater access to schools or neighborhoods of relatively higher quality, as might be hypothesized based on receipt of housing assistance. Moreover, we further recommend to examine if students in assisted housing do in fact reside in better neighborhoods and attend higher performing schools, both cross-sectionally and over time, as it is hypothesized that some forms of housing assistance promote residence in neighborhoods with less concentrated poverty, and with higher quality schools.

Research Questions

1. Is assisted housing status associated with better educational outcomes?
2. Are the associations between assisted housing status and educational outcomes mediated by
 - a. residential instability;
 - b. school mobility;
 - c. better neighborhood quality; or
 - d. better school quality?
3. Is assisted housing status associated with better neighborhood quality over time?
4. Is assisted housing status associated with better school quality over time?

Method

◆ Site Selection

Based on a 2008 national survey to locate existing integrated data system sites (Culhane et al. 2009), we identified 3 locations—Pittsburgh, Pennsylvania; the State of South Carolina; and the State of Michigan—as having both housing and educational data or having real potential to acquire it for their integrated database systems. After

identifying these sites for inclusion in this project, we surveyed them further to determine their specific housing and educational data sources and data elements, which are provided in Exhibits 3-5. The sites met in Philadelphia on January 18, 2011 to discuss the study design of the project.

◆ **Sample**

The sample consists of two groups: an assisted housing group and a matched unassisted housing group. The matching process would be based on demographic characteristics obtained from school records, including gender, address, race/ethnicity, age, and free/reduced lunch eligibility (a proxy for assisted housing eligibility). We recommend selecting 2 study cohorts, 3rd graders and 6th graders from academic year 2005-2006, and then follow them through academic year 2009-2010 (5 years). For the 3rd grade cohort, data would be collected through 7th grade. For the 6th grade study cohort, data would be collected through 10th grade. The rationale for selecting these 2 study cohorts is based on the availability of standardized tests at baseline (first available for children at 3rd grade) and to examine potential developmental differentiation in assisted housing impacts based on age (comparing children and adolescents).

Measures

The following data were found to be available at multiple time points for children enrolled in public school districts:

Housing Variables

- Assisted housing program type
- Residential instability
- Homelessness
- Neighborhood quality

Student-Level Education Variables

- Demographics (i.e., age, gender, address, race/ethnicity, and free/reduced lunch)
- State reading and math standardized tests
- Attendance rates
- Dropout status
- Graduation status
- Grade retention
- Suspensions
- School mobility

School Quality Indicators

- Averaged reading and math standardized tests
- Number of students
- Number of teachers
- Percentage of free/reduced lunch recipients
- Attendance rates
- Grade retention rates
- Expulsion rates
- Suspension rates
- Dropout rates
- Graduate rates

◆ **Housing Variables**

Assisted housing status—This is a binary variable that indicates assisted housing and unassisted housing status for the index year 2006.¹ Assisted housing status is indicated by voucher receipt or residence in a Section 8 project-based assistance unit, LIHTC, or public housing development unit. These records could be matched by address or student name to HUD and/or PHA data sources. Unassisted housing status would be measured by free/reduced lunch status within school district records (a proxy for eligibility for assisted housing) and absence of housing assistance in years 2006-2010.

Residential instability—This variable would be defined as the number of residential moves in school address records from academic year 2005-2006 to academic year 2009-2010. The study could account for one move per year (based on a cross-sectional file of student records), resulting in this variable being measured on a scale of 0-5. Additional files could be explored for change of address information as another way of obtaining data or as a validity check. Some sites may be able to provide intrayear mobility data, but this would require additional data analysis.

Homeless— This variable would be based on residency in a public shelter using Homeless Management Information Systems (HMIS) data and school district homelessness flags.

Neighborhood quality over time—This variable would be determined by change in block group characteristics of addresses, by poverty rate and other factors, comparing locations in 2006 vs. 2010.

◆ **Education Variables**

Demographics—Age, gender, address, race/ethnicity, and free/reduced lunch. The data could be obtained from education records in the academic year 2005-2006.

Individual student educational outcomes—This variable would be based on state Adequate Yearly Progress (AYP) measures of academic proficiency and engagement, such as state proficiency levels in reading and math, as well as attendance rates. AYP measures are suggested because standardized AYP measures are required of all schools and students in each state, under the No Child Left Behind Act. The educational outcomes in the academic year 2005-2006 could serve baseline measures and control variables in the analytic models to clarify the impact of assisted housing status on student educational outcomes in the academic year 2009-2010.

School mobility—Administrative school records could be used to determine the number of school moves from academic year 2005-2006 to academic year 2009-2010. This would be measured on a scale of 0-5, which allows for one move per year. Some sites may be able to provide intrayear mobility data, but this would require further data analysis.

School quality over time—This variable would indicate if students move from lower to higher quality schools. School quality could be measured using the aggregated measures that each participating state uses as its AYP measures of school accountability (see above Individual student educational outcomes). The difference in the school AYP measures from 2006 versus 2010 would be used to determine changes in school quality over time, and changes in student body characteristics (e.g., percentage receiving free/reduced lunch, racial group percentages) would be controlled as this could affect changes in AYP measures. We recommend considering other school-level quality measures listed in Exhibit 4 that have been identified as school quality indicators in the literature to determine if they would enhance the comprehensiveness of the quality measure. The potential indicators and recommended methodology for developing this school quality measure are detailed in the 'Variable Selection and Construction' section below.

¹ HUD's tenant data for PHA-administered programs (public housing, Housing Choice Vouchers, and Mod Rehab) are maintained in the Public and Indian Housing Information Center (PIC). Tenant data for assisted multifamily programs are collected from housing providers through the Tenant Rental Assistance Certification System (TRACS). HUD's data for the LIHTC program (which is administered by the Department of Treasury) cover LIHTC developments and units, but not tenant characteristics.

Data Availability

Each site was sent the following three matrices to fill out (see Exhibits 3-5). The name of the site is indicated in the cell if that site has the corresponding data for the year represented. "P" is used to represent Pittsburgh, Pennsylvania, "M" is used to represent the State of Michigan, and "SC" is used to represent the state of South Carolina. If no site has the data indicated, the cell is marked "0."

Exhibit 3: Student Data

EDUCATION DATA					
STUDENT DATA	2006	2007	2008	2009	2010
Identifiers					
Name	P, M, SC				
DOB	P, M, SC				
SSN	0	0	0	0	0
School ID	P, M, SC				
Address	P, M	P, M, SC	P, M, SC	P, M, SC	P, M, SC
Demographics					
Grade	P, M, SC				
Free/reduced lunch	P, M, SC				
Race	P, M, SC				
Sex	P, M, SC				
Special Needs	P, M, SC				
DLL	M, P	P, M, SC	P, M, SC	P, M, SC	P, M, SC
Family Characteristics	0	P	P	P	0
State Achievement Tests					
Reading					
Grades 3-5	P, M, SC				
Grades 6-8	P, M, SC				
Grades 9-12	P, M, SC				
Math					
Grades 3-5	P, M, SC				
Grades 6-8	P, M, SC				
Grades 9-12	P, M, SC				
Progress					
Retention	P, M, SC				
Drop Out	P, M	P, M, SC	P, M, SC	P, M, SC	P, M, SC
Behavior					
Attendance	P, M	P, M, SC	P, M, SC	P, M, SC	P, M, SC
Suspensions	P,M*	P,SC,M*	P, SC, M*	P, M, SC	P, M, SC
Other Disciplinary Action	P	P, SC	P	P, M, SC	P, M, SC

*Michigan has expulsions only.

Exhibit 4: School Level Data

EDUCATION DATA					
SCHOOL LEVEL DATA	2006	2007	2008	2009	2010
School Characteristics					
Designation of charter school status	SC, M				
Enrollment Size	P, M, SC				
Number of teachers per school	0	SC	SC	SC	SC
Achievement					
Adequate Yearly Progress Status	P, M, SC				
Percentage Proficiency for each state administered test	P, M, SC				
Student Information					
Percentage Free & Reduced Lunch	P, M, SC				
Attendance Rate	M, P	P, M, SC	P, M, SC	P, M, SC	P, M, SC
Retention Rate	P, M, SC				
Suspension Rate	M *, P, SC	M*, P, SC	M*,P, SC	P, M, SC	P, M, SC
Dropout Rate	P, M	P, M, SC	P, M, SC	P, M, SC	P, M, SC
Graduation Rate (High School)	P, M, SC				
Teacher Information**					

*Michigan has expulsion rates only.

**Sites will investigate the availability and likelihood of obtaining these data.

Exhibit 5: Housing Data²

HOUSING DATA					
	2006	2007	2008	2009	2010
PHA					
Developments	P	P	P	P	P
Vouchers	P, M				
Section 8 project-based	P	P	P	P	P
HMIS*	P, M, SC				
LIHTC	P	P	P	P	P

*South Carolina and Michigan are unsure of how complete these data are statewide.

² Although assisted housing data will be provided by HUD for all of the participating jurisdictions, we are providing here a table to show what data are already available locally.

Variable Selection and Construction

As listed in the table of measures above, linked individual student records with assisted housing records (either by address or student name) would enable each school district, public housing authority, county, and/or state in the nation to develop both local and statewide measures of educational achievement and adjustment among assisted housing students. A readily available comparison group of students eligible for free or reduced lunch would also be available in all states, as would comparisons to local or statewide averages.

The metrics of *school achievement and adjustment by student* would be based on federally mandated (by the Department of Education) adequate yearly progress (AYP) measures, including standardized tests in reading and math, attendance rates, drop-out rates, and disciplinary measures (suspensions/expulsions). These measures would provide direct and valid assessments as to how assisted households' students are faring in comparison to comparable students not in assisted housing, and for comparable general populations by locality or state. In other words, average values on these measures could serve as metrics of educational achievement and adjustment. (Separate measures could be computed by various assisted housing categories – developments, versus vouchers, etc. – as well.)

With respect to *education access and opportunity*, aggregate measures of student achievement and adjustment, based on the average values for the schools attended by assisted households' students, in comparison to the schools attended by comparable non-assisted households (free or reduced lunch households) or to local- or state-wide schools, could each serve as metrics of access to educational opportunities. Given the lack of consensus regarding the an appropriate measure of school quality in the Department of Education, we have identified additional salient indicators of *school quality*, in addition to state test scores, that our network sites have on a school wide level that have been found to relate to improved student educational well-being (United States Department of Education, 2000). These include: number of students, number of teachers, student attendance rates, student retention rates, student expulsion or suspension rates, teachers education credentials, teacher turnover rates, and dropout and graduate rates for high schools. We suggest determining which of these variables are significantly related to the measures of educational well-being and using them along with aggregate achievement measures to derive empirical estimations of school quality. Because these measures would be compiled for the schools actually attended by students in assisted housing (or not, for the unassisted students in the comparison group), the average values would reflect valid metrics of relative accessibility/attendance. (Separate measures could be computed by various assisted housing categories – developments, versus vouchers, etc. – as well.)

Data Analysis Plan

◆ Question 1: Relations between assisted housing status and educational outcomes

The recommended study would investigate how assisted housing status (assisted or non-assisted) is related to student academic proficiency level (reading and math) and attendance rate, controlling for demographic characteristics (such as, gender, age, race/ethnicity, and free/reduced lunch), through matched-pair study groups. Logistical regression models are suggested to estimate coefficients of dichotomous outcome variables (proficiency and non-proficiency in reading and math). Linear regression models, on the other hand, will be used to estimate the variance of parameters for continuous outcome variables (attendance rates).

Residential and school instability as well as better neighborhood and school quality are potential mediators of the relationship between assisted housing status and educational outcomes. Mediation analyses are recommended to indirectly assess the effect of assisted housing status on educational outcomes through residential instability or school instability. Furthermore, it would be possible to assess the mediating effects of better neighborhood and school quality on the association between assisted housing status and educational outcomes.

◆ **Question 2a: The mediating effect of residential instability on the relations between assisted housing status and educational outcomes**

A mediating model assumes that assisted housing status influences residential instability. Changes in the residential instability, in turn, influence educational outcomes. In order to specify the indirect impact (process) of residential instability on the association between assisted housing status and education outcomes, residential instability could be added to the existing models in Question 1 to determine the presence or absence of a mediation effect. The Sobel test would then be used to determine the significance of the indirect effect. If samples sizes are too small or sample distributions are not normal, bootstrap methods may be used in place of the Sobel test.

◆ **Question 2b: The mediating effect of school instability on the relations between assisted housing status and educational outcomes**

The same data analytic procedure used in Question 2a is recommended to be used in Question 2b.

◆ **Question 2c: The mediating effect of better neighborhood quality on the relations between assisted housing status and educational outcomes**

To specify the indirect impact (process) of better neighborhood quality on the association between assisted housing status and education outcomes, better neighborhood quality could be added to the existing models (in question 1) to determine the presence or absence of a mediation effect. The Sobel test would then be used to determine the significance of the indirect effect. If samples sizes are too small or sample distributions are not normal, bootstrap methods may be used in place of the Sobel test.

◆ **Question 2d: The mediating effect of better school quality on the relations between assisted housing status and educational outcomes**

The same data analytic procedure used in Question 2c would be used in Question 2d.

◆ **Question 3: Relations between assisted housing status and better neighborhood quality.**

Logistical regression models are recommended to investigate whether neighborhood quality (change to better neighborhood) varies as a function of assisted housing status while controlling for demographic characteristics (for example, gender, age, address, race/ethnicity, and free/reduced lunch).

◆ **Question 4: Relations between assisted housing status and better school quality.**

The same data analytic procedure used in Question 3 would be used in Question 4.

Conclusions

In its initial task order for this project, HUD requested that the contractor develop a metric of educational opportunity for residents of assisted housing based on aggregate education data available nationally from the US Department of Education. The advantage of such a measure was that it would use readily available national data at the school level as its measure of educational opportunity and readily available data from HUD regarding the location of assisted housing recipients, at the address level. Possible measures include a variety of proximity measures between HUD assisted housing units and school locations.

A fundamental problem with this approach is that the aggregate school data severely compromise the validity of the measure. First, geographic proximity to a school does not equate to actual access to a school. Magnet

schools, charter schools, and many public high schools may have enrollment requirements that restrict access to students, regardless of students' locations. Second, aggregate measures of school performance do not demonstrate educational achievement and social-emotional adjustment for assisted household residents even if they attend higher performing schools. Such inferences would commit an ecological fallacy.

This alternative approach suggests that the linkage of individual housing and education records through integrated data systems allows for the development of multiple metrics of educational access and opportunity, as well as metrics of individual achievement and adjustment, referred here collectively as measures of educational well-being. The metrics and study described in Chapter 3, while recommended to be demonstrated in three locations with existing integrated database systems, are potentially feasible to complete nationally, but on a state by state basis.³ Fortunately, the key independent variables – assisted households by program type – are available through HUD for the nation as a whole. Thus, it is feasible for HUD to generate state (or county, or school district) level databases for each of its assisted housing programs, with the intent of sharing those with states or counties or school districts. The data sharing arrangements outlined in Appendix A, and possibly other data sharing arrangements pending review by the Department of Education through its FERPA compliance office, would identify legal and secure means for generating the researchable, linked education and housing databases. These de-identified or research-ready integrated data sets could then be used to generate the metrics described above. Researchers, municipalities, states, or HUD (or local PHAs) would have to execute the necessary data exchange agreements at their respective levels of authority. However, once obtained, these metrics should be valid and reliable measures of educational well-being for assisted households, both in terms of individual achievement and adjustment, and in terms of access to educational opportunity, based on school quality measures. To the extent that these agreements are reached nationwide, HUD will have state-level measures nationally for all of its programs.

The feasibility of this occurring is high, but not in the short term. Because many states are still in the construction phase of their statewide, longitudinal student data systems, access to student data nationwide would be contingent on reaching agreements in thousands of school districts, which is not feasible. However, as these state-based systems are implemented over the next 2-3 years, the opportunity will emerge for HUD and their partners to reach data exchange agreements with state educational authorities. Partnerships now between the US Departments of Education and HUD could in fact develop templates for such agreements, and, on a demonstration basis, develop the metrics that are proven to be the most robust and informative. Such is the purpose of the study recommended here in Chapter 3. Given cooperation between the US Departments of Education and HUD, and pending funding for these activities, nation-wide research, or at least multi-state research could be feasible on a widespread basis within the next four to five years.

There are several limitations to consider with regard to this approach. First, because these metrics will be developed based on state or local level education data sets, there is no single national source of data for developing metrics that could be used nationwide, now. However, this limitation is made up for by the fact that the result metrics are highly valid relative to what can be derived from the current school-level data sources available now from the US Department of Education. Second, as in all uses of standardized testing data, such data have inherent limitations. The literature has long established that standardized tests contain biases that favor groups from higher socioeconomic statuses. These and other factors associated with the testing mandates, have led critics to question whether standardized tests are sufficient for many of the purposes to which they are put, including, potentially, measuring the relative educational well-being of assisted housing residents. However, given that comparison groups of unassisted households eligible for free or reduced lunch are included here in the recommended study and metrics, some of this bias may be mitigated. Finally, attempts to extend this analytic framework and the suggested metrics on a national basis would require some resources. While these resources are likely greater than would be required using existing aggregate school-level data sets from the US Department of Education, the resources required are still far below those required based on primary data collection efforts, and could be done in a timely manner.

³ A study examining the associations between homelessness, school mobility, and educational well-being of young children in one of the network sites is presented in Appendix B. This study demonstrates the feasibility of linking housing and education data for entire cohorts of children using this network.

Alternative Approach:

Assessing the Impact of HUD's Assisted Housing Programs on Educational Opportunity and Well-being

This alternative approach and recommended study would generate knowledge about the impact of HUD's assisted housing programs on educational outcomes, access to educational opportunities, and neighborhood quality. The presence and size of positive impacts associated with assisted housing programs (by type) could potentially influence public support for these programs. The extent to which these differences are mediated by residential instability and school instability would provide evidence that housing assistance may be a critical, stabilizing factor to improving student educational opportunities and achievement. Such a result would support HUD's FY 2010-2015 Strategic Plan, the third goal of which is to "utilize housing as a platform for improving quality of life," noting that "stable housing, made possible with HUD support, provides an ideal platform for delivering a wide variety of health and social services to improve health, education, and economic outcomes." Indeed, one of the subgoals is to "utilize HUD assistance to improve educational outcomes and early childhood development." This study thus has the potential to provide evidence regarding the degree to which HUD's housing assistance programs meet these goals, and which particular programs are doing so, either by enabling greater access to better neighborhoods and schools, or through promoting greater residential and school mobility.

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Appendix A

Establish generalizable models for sharing housing and education data that are developed in partnership with the US Department of Education's Family Policy Compliance Office, which implements the Family Educational Rights and Privacy Act (FERPA).

Based on a previous survey of counties, states and universities with an integrated data system (IDS) (Culhane, et al., 2010), the research team developed three scenarios for the integration of education and housing data sources. These scenarios vary with respect to the auspices of the hosting of the IDS, and the method for data storage and record linkage. While many potential scenarios are possible, these three were selected as among the most likely to comply with FERPA regulations. The research team has had two meetings with representatives of the US Department of Education from the Department's FERPA Compliance, Educational Policy, and General Counsel Offices to discuss these three potential data integration strategies. These representatives were most cooperative. The research team's requests were timely since they were concurrent with major requests to address these issues (for example, Statewide Longitudinal Data Systems and Statewide Integration of Early Childhood Data REFS). We are awaiting feedback with respect to our requests. We are also in communication with Department of Education officials regarding guidance that is pending regarding record storage procedures that are compliant with FERPA. From our communications with the Department, we are aware that a major written statement addressing integration of educational records at the individual student level is forthcoming in the Federal Register.

Exhibit A depicts a publicly administered system that stores both housing/PHA data and educational data. Given some restrictions within FERPA regarding the storage of identified student records along with other public agency data that are not education related, we have indicated that these systems may be hosted by nonoperational agencies/entities within local or state government, to assure that they will not be used for student contact, or to disclose individual student information to persons other than those authorized to access them for analytic purposes. In this case, the identifiers are retained and used for record linkage, but the data sets created for research are de-identified, as required by FERPA.

Exhibit B depicts an alternate strategy that uses encryption to protect student identifiers. In this case, both agency sources (Education and PHAs) encrypt their data with a common algorithm. The records are linked on the basis of that algorithm by personnel who are not involved in, nor have access to the encryption key. The encrypted integrated data set can then be used to generate de-identified data sets for research purposes.

Exhibit C depicts a designated 3rd party (such as, University) as the place for record storage and record linkage. Under this scenario, the 3rd party becomes a contract agent, separately, of both the school district and the housing agency, and under that contract, provides protection of the identified data and links the identifiers for the purposes of creating analytic data sets only at the direction and approval of the data owners. Researchable data sets can be created by de-identifying the data and creating custom data sets for approved research purposes.

We will continue to consult with both the US Departments of Education and Housing and Urban Development about the feasibility of these data integration approaches in support of Chapter 3, particularly in light of the forthcoming FERPA guidelines.

Exhibit A: Integration with Identifiers – Government Host

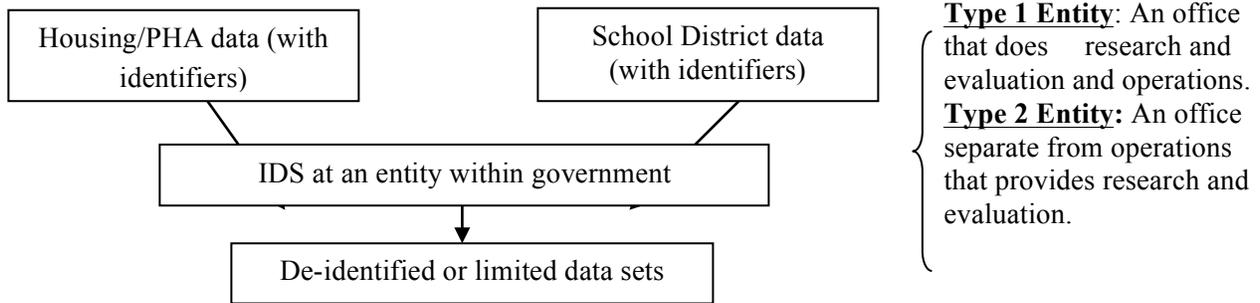


Exhibit B: Integration with Encryption – Government Host

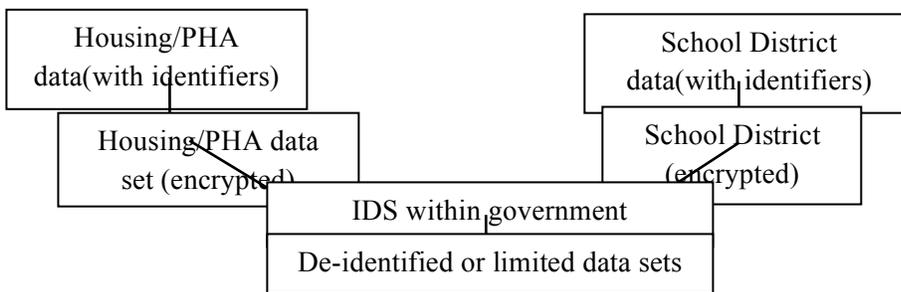
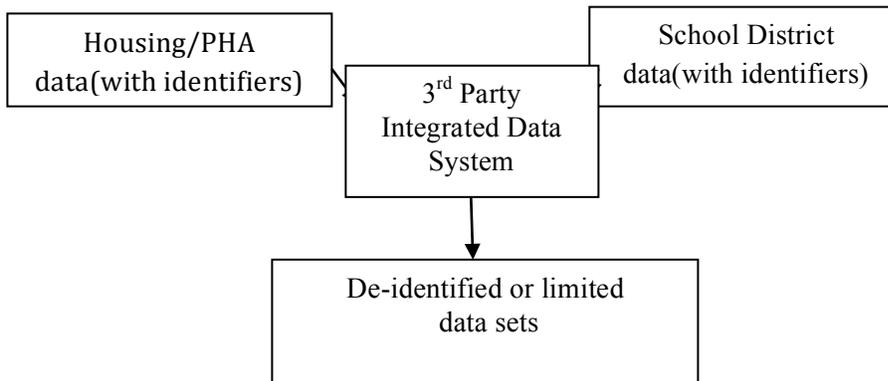


Exhibit C: Integration with Identifiers – 3rd Party Host (University, Research Institute)



Appendix B

A Study of the Effect of the Homeless Experience on Educational Well-being with the Use of an Existing Integrated Data Set

Introduction

Residential instability is a disruptive experience for children and families. Homelessness, a severe form of residential instability, disproportionately occurs among young children from low-income families. Eight percent of children from low-income families experience homelessness over the course of a year (Rog, Holupka, & Patton, 2007), and approximately half of the children entering homeless shelters are under the age of six (Cortes, Khadduri, Buron, & Culhane, 2010). The vulnerability associated with homelessness among young children has become of great concern to policymakers in the education, housing, and child welfare public service systems, particularly in relationship to children's educational success. In response to the educational risk for homeless children, Congress created the Education for Homeless Children and Youth program as a part of the McKinney-Vento Homeless Assistance (MVHA) Act (2001).

There is a small body of research examining the association between homelessness and educational outcomes for young children that underscores the need for the MVHA Act. These few empirical studies investigating the relation between early homelessness and educational well-being, however are hindered by several methodological shortcomings that limit their ability to inform the MVHA Act:

1. These studies for the most part relied upon homeless and low-income housed children from a non-representative group of local agencies or shelters. Using this method of convenience sampling draws upon only the homeless shelters that are amenable to participating in the research process rather than the full spectrum of operating homeless shelters.
2. These studies do not employ a consistent definition of homelessness.
3. Furthermore, the definition of homelessness in most of these studies came from maternal retrospective reports. It has been documented that self report of past experiences is unreliable due to memory failure and unwillingness to report negative events such as homelessness (Boruch, 1997).
4. These studies do not examine the *unique* and *combined* effects of homelessness and school mobility on the educational well-being of young children. This is problematic because the policy identifies homelessness as the precursor to school mobility and does not identify whether they have differing effects on young children's educational well-being.

The present study sought to address the limitations of previous studies by investigating the unique and combined effects of homelessness and intra-district school mobility in an entire population of young children enrolled in a large poor urban public school district, where the homelessness data were collected by shelter staff using HMIS definitions of homelessness.

Method

◆ Participants

The participants were drawn from the original cohort of 10,841 students, the entire third-grade cohort in the 2005-2006 school year who were born in a large urban area. The analytic sample consisted of 8,762 students (81% of the original cohort) who had four years of active status in the public school district and at least one educational outcome with valid data. Exhibit 1 displays child and family characteristics of the original cohort and the analytic sample. Regarding the experience of homelessness and school mobility, nearly 4% were students with only a homelessness experience, approximately 34% were students with only a school mobility experience, and nearly 6% were students who experienced both homelessness and school mobility.

◆ **Procedure**

This study used integrated administrative data from municipal agencies and the school district obtained through the Kids Integrated Data System (KIDS; Fantuzzo, Culhane, Rouse, Bloom, & Roig, 2006). KIDS is one of the nation's first fully integrated municipal administrative data systems for children and youth that was developed to improve public services to children and youth through scientifically rigorous research and evaluation studies reflecting co-constructed research agenda. KIDS includes administrative data from children's birth records, physical and mental health service utilization records, Medicaid eligibility, homelessness and child welfare services, and public school education records. These data are collected annually from the school district and each major public service agency in the city that serves children and families. KIDS currently includes longitudinal, archival records across these agencies from 1990 to 2008. This unique system provides the capacity to produce research-ready data sets to respond directly to community-based needs through population-based inquiry. It provides for cost-effective and time-sensitive research to inform public policy and practice.

Data were provided by two public service systems that are charged with objectively monitoring and promoting the well-being of these children. Homelessness data came from the Office of Supportive Housing in the municipality under study which uses the U.S. Department of Housing and Urban Development (HUD) Homelessness Management Information Systems (HMIS) (HMIS; U.S. Department of HUD & Culhane, 2004). HMIS is municipal-level data system that is used nationally by trained professionals in homeless shelters to collect at the individual client level using a standardized protocol. HMIS, therefore, provides a uniform definition of homelessness that can be used by local and national policymakers and researchers to understand trends in homelessness. The public school district provided administrative data for children's school enrollment changes and academic and behavioral outcomes over time. Specifically, this study used these two data resources through the Kids Integrated Data System (KIDS). KIDS is a state-of-the-art integrated data system that scientifically integrates and audits administrative data across the public service systems of an entire municipality for research to inform policy decisions (Fantuzzo et al., 2006).

Measures

◆ **Homelessness**

Information regarding children's homeless experiences was collected from the Office of Supportive Housing (OSH). Homelessness was determined by identifying a parent within the database who registered in a public shelter with children at any time between the child's birth and the end of third grade. If the parent was not identified within this system, the child was classified as not having a homeless experience. OSH is the funder of homelessness assistance programs in Philadelphia, and 97 percent of the emergency shelter beds in Philadelphia are tracked through the city's automated HMIS.

◆ **School mobility**

School mobility was obtained through school district enrollment records. If the child enrolled in a different school within the district between the kindergarten and third-grade school years, this was considered a school move and coded as "mobile".

◆ **Reading and math achievement**

Children's standardized reading and math achievement was assessed by the Complete Battery Plus version of the TerraNova, Second Edition (CTB/McGraw-Hill, 1997). (Reading: range = 407-1194, SD= 41.3; math: range= 324-1081, SD= 44.8)

◆ **Classroom behavioral adjustment**

Teacher ratings of classroom behavioral adjustment were recorded at the end of the spring marking period during third grade using the Classroom Conduct Scale (Fantuzzo, Rouse, McDermott, Sekino, Childs, & Weiss, 2005). This scale has two factors: one represents task engagement and includes items such as persisting on difficult tasks to completion. The second factor represents social engagement and items include cooperation with peers and teachers and asking for and receiving help. The higher scores indicate poorer social and task engagement (Mean =200, SD=50).

◆ **Prior academic level**

Children's previous academic achievement was obtained by kindergarten teachers at the end of the spring semester using the Dynamic Indicators of Basic Early Literacy Skills (DIBELS; Good & Kaminski, 2002).

◆ **Prior classroom behavioral adjustment**

Teacher ratings of kindergarten classroom behavioral adjustment include two sets of indicators: Learning Behaviors Performance Assessment (LBPA) and the Social Skills Performance Assessment (SSPA).

◆ **Child and family covariates**

Child demographic data were collected from School District enrollment records and included age, gender, race/ethnicity, and poverty status. Poverty was indicated based on children's participation in free or reduced lunch anytime before or during third grade. The School District used TANF to determine eligibility.

◆ **Absenteeism**

School District administrative records included daily attendance for every child. Daily attendance was used to calculate the number of unexcused absences for each child across the third-grade school year. The number of unexcused absences was divided by the total days that child was enrolled in school and the resulting percentage of unexcused absences was used.

◆ **Data Analysis**

Multi-level (hierarchical) linear regression was used to analyze the unique and combined effects of homelessness and school mobility on academic achievement and classroom behavioral adjustment (social engagement and task engagement) in third grade. The coefficients display the change of the group mean of the outcomes due to a discrete change in homelessness or school mobility (none vs. any experience) while holding other predictors constant. Effect size was calculated and used as a standardized index of mean differences between groups (e.g., non-homeless vs. homeless, non-mobile vs. mobile). Effect size of around .2 might indicate a small effect, .5 a medium effect and .8 a large effect.

Results

◆ **Effect of Homelessness on Academic Achievement and Classroom Behavioral Adjustment**

Exhibit D presents the effect of homelessness on academic achievement (reading and math) and classroom behavioral adjustment (social and task engagement). Homelessness was significantly associated with lower academic achievement and higher classroom behavioral maladjustment while adjusting for child and family covariates and absenteeism. Among academic achievement, homelessness was only associated with lower reading

scores (-4.90, $p < .01$) with a corresponding effect size of .06. It indicates that homeless experience was associated with the decreased reading mean scores of 613.85 (i.e., 618.75 (intercept)-4.90 (coef.)=613.85). Among classroom behavioral adjustment, homelessness was significantly associated with both lower social engagement and task engagement. Moreover, homelessness had a more substantial, adverse effect on social engagement (9.91, $p < .001$) than task engagement (7.11, $p < .001$) with corresponding effect sizes of .12 and .09, respectively. Homelessness was significantly associated with poorer social engagement and task engagement mean scores of 181.58 (i.e., 171.67+9.91) and 182.03 (i.e., 174.92+7.11), respectively.

Exhibit D: Homelessness Effects on Reading, Math, Social Engagement, and Task Engagement in Third Grade

	Reading Coef.	Math Coef.	Social Engagement Coef.	Task Engagement Coef.
Fixed Effects				
Intercept	618.75***	586.31***	171.67***	174.92***
Homeless	-4.90**	-3.23	9.91***	7.11***
Male	-6.22***	-1.25	20.49***	21.59***
African American	-7.60***	-17.69***	15.44***	10.78***
Latino	-7.60***	-12.88***	7.31***	8.18***
Other race	-3.38	-1.72	-5.34*	-2.89
Free/Reduced lunch	-4.61***	-3.91***	3.53***	2.78**
Prior academic levels	1.47***	1.45***		
Prior behavior problem			8.55***	8.59***
Absenteeism	-0.35***	-0.42***	0.43***	1.04***
Random Effects				
Intercept	139.69***	171.59***	106.00***	107.96***
Residual	1298.93***	1528.33***	1581.31***	1580.81***
N	8482	8452	7897	7897

Note. Prior academic levels and absenteeism are group-centered level 1 variables.

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

◆ **Unique Effects of Homelessness and School Mobility on Academic Achievement and Classroom Behavioral Adjustment**

Exhibit E presents the *unique* effects of homelessness and school mobility on academic achievement (reading and math) and classroom behavioral adjustment (social and task engagement). Findings indicated that both homelessness and school mobility were associated with poor academic achievement and classroom behavioral adjustment. Among academic achievement, homelessness was only associated with poor reading scores (-4.31, $p < .05$), with an effect size of .05. On the contrary, school mobility had comparable effects on both decreased reading and math scores (-3.25, $p < .001$; -3.22, $p < .01$), with effect sizes of .05 and .04, respectively. Among classroom behavioral adjustment, both homelessness and school mobility had an effect on classroom behavioral adjustment. Homelessness was associated with poor social engagement (8.76, $p < .001$) and task engagement (6.22, $p < .001$), with effect sizes of .11 and .08. School mobility was associated with poor social engagement (6.83, $p < .001$) and task engagement (5.30, $p < .001$), with effect sizes of .10 and .08. Findings showed that homelessness in general had slightly greater effect on classroom behavioral adjustment than school mobility. Specifically, both homelessness and school mobility had greater unique effects on social engagement than task engagement in classrooms.

Exhibit E: Homelessness and School Mobility Effects on Reading, Math, Social Engagement, and Task Engagement in Third Grade

	Reading Coef.	Math Coef.	Social Engagement Coef.	Task Engagement Coef.
Fixed Effects				
Intercept	619.22***	586.77***	170.84***	174.27***
Homeless	-4.31*	-2.64	8.76***	6.22***
Mobility	-3.25***	-3.22**	6.83***	5.30***
Male	-6.17***	-1.20	20.38***	21.50***
African American	-6.94***	-17.04***	14.21***	9.83***
Latino	-7.14***	-12.47***	6.52**	7.57***
Other race	-3.27	-1.61	-5.40*	-2.94
Free/Reduced lunch	-4.26***	-3.56**	2.77**	2.20*
Prior academic levels	1.46***	1.44***		
Prior behavior problem			8.12***	8.25***
Absenteeism	-0.33***	-0.39***	0.38***	1.00***
Random Effects				
Intercept	139.66***	171.50***	105.43***	107.79***
Residual	1296.82***	1526.31***	1571.64***	1575.04***
N	8482	8452	7897	7897

Note. Prior academic levels and absenteeism are group-centered level 1 variables.

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

◆ **Combined Effect of Homelessness and School Mobility on Academic Achievement and Classroom Behavioral Adjustment**

This study further differentiated the effects of homelessness *and* school mobility by studying the effect of experiencing both of these factors on academic achievement and classroom behavioral adjustment. As shown in Exhibit F, among academic achievement (both reading and math), students who experienced only homelessness had no significant differences from students without any homelessness and school mobility experiences. Students who experienced school mobility alone had lower reading and math score than students without any homelessness and school mobility experiences ($-3.21, p < .001$; $-3.59, p < .001$), with effect sizes of .05 and .05. Students with the combined experience of homelessness and school mobility had lower reading and math score than students without any homelessness and school mobility experiences ($-7.70, p < .001$; $-4.72, p < .05$), with effect sizes of .11 and .06.

Homelessness, school mobility, and the combined experience of homelessness and school mobility had differentiated effects on classroom behavioral adjustment. Students with only a homelessness experience had significant differences from students without any homelessness and school mobility experiences in social engagement and task engagement ($11.22, p < .001$; $8.63, p < .001$), with effect sizes of .18 and .14. Students with only a school mobility experience had lower social engagement and task engagement than students without any homelessness and school mobility experiences ($7.23, p < .001$; $5.69, p < .001$), with effect sizes of .11 and .09. Additionally, students with the combined experience of homelessness and school mobility had lower social engagement and task engagement than students without any homelessness and school mobility experiences ($14.31, p < .001$; $10.25, p < .001$), with effect sizes of .23 and .16. In general, experiencing homelessness, school mobility, or both homelessness and school mobility had greater effects on social engagement than task engagement.

Exhibit F: Combined Effects of Homeless/Mobility on Reading, Math, Social Engagement, and Task Engagement in Third Grade

	Reading Coef.	Math Coef.	Social Engagement Coef.	Task Engagement Coef.
Fixed Effects				
Intercept	619.21***	586.85***	170.76***	174.19***
Homeless only	-4.04	-4.93	11.22***	8.63***
Mobility only	-3.21***	-3.59***	7.23***	5.69***
Homeless/ Mobility	-7.70***	-4.72*	14.31***	10.25***
Male	-6.16***	-1.20	20.39***	21.51***
African American	-6.95***	-16.97***	14.15***	9.76***
Latino	-7.14***	-12.42***	6.48**	7.52***
Other race	-3.28	-1.59	-5.41*	-2.95
Free/Reduced lunch	-4.26***	-3.54**	2.74**	2.16*
Prior academic levels	1.46***	1.44***		
Prior behavior problem			8.12***	8.25***
Absenteeism	-0.33***	-0.39***	0.38***	1.00***
Random Effects				
Intercept	139.68***	171.50***	105.30***	107.54***
Residual	1296.97***	1526.20***	1571.53***	1574.98***
N	8482	8452	7897	7897

Note. Reference group = students without any history of homelessness/mobility. Prior academic levels and absenteeism are group-centered level 1 variables.

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

Discussion

The McKinney-Vento Homelessness Assistance Act targets two hypothesized risk factors to early school success—homelessness and school mobility. The purpose of this study was to investigate the unique and combined effects of these risks on the academic achievement and classroom behavioral adjustment. This study was conducted using integrated administrative data collected by public surveillance systems and prepared for empirical study. These integrated data allowed for the first population-based study to examine the differentiated and combined effects of homelessness and school mobility on the educational well-being of young children for their first national benchmark of academic proficiency under the No Child Left Behind Act (2001).

Results indicated that the combined experience of homelessness and school mobility was related to *both* poor academic achievement and poor classroom behavioral adjustment. Furthermore, experiencing both homelessness and school mobility was associated with higher risk for poor educational well-being than experiencing either homelessness or school mobility alone. These findings indicate that instability in both home and schooling environments is associated with the worst educational outcomes. Additionally, the combined experience of homelessness and school mobility had a more substantial negative effect on reading than on math achievement. Early homelessness represents a significant disruption in social support systems in the home learning environment required for positive reading achievement.

The lack of stability in early social interactions associated with homelessness was also shown to greatly affect young children's classroom behavioral adjustment in this study. Children with a homeless experience demonstrated substantial declines in both task and social engagement in school, and these findings were more pronounced for social engagement.

In our final model, controlling for school mobility, there was no significant relation between homelessness and academic achievement. This lack of relationship is contrary to previous research. Early homelessness did not have a significant effect on math achievement in any of the models tested. The significant association between

homelessness and reading achievement was lessened once accounting for school mobility, and was entirely non-detectable once accounting for the combined experience of homelessness and school mobility. These findings suggest that the association between homelessness and reading achievement is likely operating through intermediate school mobility experiences. Future studies need to test this theory.

School mobility was uniquely associated with academic achievement in third grade and affected both reading and math achievement at comparable levels. These findings are consistent with previous school mobility research that was reviewed in a recent meta-analysis (Reynolds, Chen, & Herbers, 2009). Intra-district school mobility within a large, urban district represents such a disruptive influence to students. They are required to adjust to an entirely new school setting, including new teachers, peers, and academic curricula. This study demonstrates that this particular form of instability, even controlling for prior achievement and homelessness, has meaningful detrimental effects on both reading and math achievement and should be included in studies of residential instability to examine meditational effects. School mobility was also shown to be related to poor classroom behavioral adjustment, which is consistent with previous work examining the association between school mobility and behavior problems (Tucker, Marx, & Long, 1998; Pettit, 2004).

Overall, the results from this study provide important empirical evidence that the McKinney-Vento Homelessness Assistance Act is appropriately targeting children who are experiencing both homelessness and school mobility, a population at exceptional risk for poor educational well-being. Using accurate national definitions of homelessness and school mobility from existing professional surveillance systems, this study establishes that children who experience both of these forms of instability are more likely to have difficulty meeting the educational demands during the early elementary years. Therefore, the educational support provisions of the McKinney-Vento Homelessness Assistance Act are much needed and are of great benefit to school administrators and teachers serving this vulnerable group of young children.

This study provides support for the overall methodology used to examine impact of residential instability on educational outcomes of children in public education. It provides a supportive research context for examining the hypothesized protective benefit of children in various HUD support assisted housing programs.

This study provides empirical evidence to determine the impact of residential instability on educational outcomes of children in the public education system. It provides supportive research for HUD's Strategic Plan (HUD's Fiscal Year 2010-2015, accessible at <http://www.hud.gov/strategicplan>) to address the challenges of the housing crisis and to utilize the assisted housing program to ensure students have greater access to high-quality schools, which in turn will promote educational well-being for children and youth.