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HOUSING AND SCHOOLING

In recent years the problems of the nation's educational system have become a primary concern of American voters and consequently of their elected officials. The concern is especially intense in large central cities, where there is an increasing consensus that economic inequality will persist as long as educational inequality does. A variety of reform proposals, from for-profit schools to school vouchers, have polarized educators and befuddled parents. Yet there has been relatively little effort made to improve the general social conditions in which inner-city students live, a factor on which educators themselves place major emphasis.

One of the most obvious environmental factors potentially affecting children's learning is the housing in which they live. Substandard conditions can impede children's education through adverse effects on their health and school attendance, and in the case of lead poisoning, directly through neurological harm. But it is also easy to see how other aspects of the housing environment can affect kids' readiness to learn and ability to concentrate in and out of school. Inadequate heat, inoperable plumbing, or rodent infestation can be distracting to any scholar, especially young ones whose study habits are still in formation. Overcrowding, frequent moves or homelessness can also be imagined to disrupt the sense of stability and security which children need to thrive.

The belief that unsanitary or unstable home environments can have a detrimental impact on children's learning has a long history in both the educational and housing reform fields. Agitation for a system of public schools started about the same time as did the first efforts to regulate housing conditions, and the same New York State legislature that passed the landmark Tenement House Act of 1901 also enacted a charter that governed the New York City public school system for nearly 70 years. The intertwined history of public education and housing reform is best exemplified by the career of Jacob Riis, who, in addition to focusing public attention on squalid slum conditions, championed educational causes such as the establishment of kindergartens and special schools, rather than jail, for truant.

Modern educators also maintain that a decent home living environment is an important input to educational attainment. In a speech before the Philosophy of Education Society, Jean Anyon argued that conditions in inner-city schools would be more easily ameliorated if improvements were made in housing, health care and economic opportunities for the pupils and their parents. In a recent Canadian survey, inner-city school teachers ranked inadequate housing and community conditions as moderately to strongly contributing to student academic failure. And in a recent paper published by the Center for Education Policy, Richard Rothstein suggests that policies aimed at improving housing conditions may be more cost-effective in raising educational attainment than equivalent spending on schools. He points out that a \$500 per pupil spending increase nationally amounts to about \$23 billion, a sum which may have more impact on educational attainment if it is spent outside the classroom.

From Rhetoric to Research

Despite the conviction of many housing advocates and educators that there is a close connection between housing quality and student achievement, little empirical research has been done to verify the relationship. The landmark "Coleman Report," which set the baseline for education research in the United States, did not include any questions regarding housing quality in its extensive student survey. Housing researchers have put a great deal of effort into documenting the effects of poor neighborhoods, but virtually none into exploring the effects of poor housing quality. Only recently has there been some effort made to quantify the effects of housing conditions on children's educational outcomes.

In one study published last year, Janet Curie and Aaron Yelowitz of the National Bureau of Economic Research investigated whether children living in public housing were more likely than others to be left back a grade in school. They found that once the observable and unobservable differences in family backgrounds are controlled for, public housing children were 12 percentage points less likely to be held back

than children in other rental accommodations. Curiously, they found that the beneficial effects were confined to boys.

In another study published last year, Sandra Newman and Joseph Harkness of Johns Hopkins University looked at whether residence in assisted housing has any effect on high school graduation rates. Their study was notable in that it matched data from the Panel Survey of Income Dynamics, which follows the same families for many years, to HUD and state housing finance agency address databases. They found that only 61 percent of children raised in public housing graduated high school, compared to 77 percent of those eligible but not receiving assistance. But the families of public housing kids were much more disadvantaged than other eligibles, and when those factors were controlled for, differences in educational attainment disappeared. However, neither did they find any positive educational effects from residence in public or private-assisted housing.

While those two studies represent the beginning of an important new effort in housing research, they share several data problems that limit their applicability. First, they distinguish between public, private-assisted and private housing, but do not incorporate data on the quality of the housing in question. Consequently, any effects on children's education that are detected cannot be attributed to specific characteristics of the housing. Second, they cannot directly control for all of the background characteristics that may distinguish public housing residents from eligible non-residents. That "selection problem" is one to which social scientists have become extremely sensitive. Both of the studies cited above utilize an advanced, but still somewhat controversial, technique known as "instrumental variables" to control for unobserved differences in families.

During the past decade there has been some research done on the effects of homelessness on children. The findings are quite nuanced, however, and caution against drawing sweeping generalizations. For example, one study of homeless children showed that their verbal and nonverbal intelligence was not affected, but that their academic achievement was. Another found that homeless children evidenced internalized psychological stress, but it appeared to wear off as kids adjusted to life in homeless shelters. One of the problems complicating research on homeless children is that they are typically subject to so many stresses in addition to homelessness, including domestic violence, foster care placement, jailed parents, and even the violent deaths of siblings or friends, that it is exceedingly difficult to untangle the independent effects of any one trauma.

One body of research that is fairly convincing has explored the effects of residential mobility on students' outcomes. In general, it has been found that changes in home location

are adverse to children's school careers. For example, Robert Haveman and Barbara Wolfe of the University of Wisconsin and James Spaulding of the U.S. General Accounting Office found that one home relocation during childhood reduces the probability that a student will finish high school by about 3 percentage points, controlling for a host of other family background variables, and that three or more moves reduces the probability of getting a diploma by nearly 8 percentage points. Moves are believed to be especially damaging if they occur during adolescence, when a young person is particularly susceptible to peer group pressures. Teenagers who change neighborhoods or schools may be less discriminating in their choice of friends and their quest for acceptance from new peers may lead them astray.

The adverse effects of excessive residential mobility has consequently become a major concern of urban educators. A 1994 GAO study found that 41 percent of the nation's third graders had already changed schools at least once and that 17 percent had attended three or more schools. Children in low-income families are more likely to be frequent movers than children in higher-income families, and inner-city residents and renters are more likely to be frequent movers than suburban residents or homeowners. Not surprisingly, residential mobility is most extreme among families who ultimately become homeless; one study of homeless children in Worcester, Massachusetts, found they moved an average of 3.4 times during the year prior to becoming homeless.

In New York City, about 13 percent of families with young children move each year. Families with annual incomes under \$25,000 are about one-third more likely to move than families with incomes over that level, and renter families with kids are about 50 percent more likely to move than families who own their own home. About 16.7 percent of low-income families with children who live in rent regulated housing move each year, compared to 20.7 percent of similar

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families in unregulated rental housing. By reducing mobility, rent regulation may indirectly help children in school, but that effect may be offset because rent regulated units are generally in poorer physical condition than unregulated units.

The sample ages were selected so that no individual would be included more than once. Because the HVS reports, for each household member, the highest level of education achieved, it was possible to determine which of the young people had attained a high school diploma.

In order to explore the effects of housing and neighborhood on youths' educational attainment, it was deemed important to establish certain background characteristics of the families in which they live. Ever since the Coleman Report it has been axiomatic that the primary influence on educational attainment stems from the composition and socioeconomic status of a student's family. By choosing only those young people who still lived with their parents it was possible to determine from the HVS many of the family variables that have been found to influence a child's education. About 62 percent of our sample of females and 69 percent of the males lived with their parents at the time of the survey. Since the HVS data are geocoded, it was also possible to determine many characteristics of their neighborhoods.

In order to estimate the effects of demographic, family, housing and neighborhood variables on the odds of a young person graduating from high school, CHPC researchers used a regression technique know as "probit." Probit regressions are particularly suited to estimating the probability of an outcome occurring, controlling for as many independent variables as the researcher judges to be important. The accompanying table shows the percentage point change in the probability of graduating high school associated with a one-unit change in the particular control variable. The units of measure are listed to facilitate interpretation. The z-statistics are a measure of statistical significance; in general, a z-statistic greater than plus or minus 1.66 indicates that the effect is significant with 90 percent confidence. The chart shows the results of separate probit regressions for males and females.

Our estimates of the effects of demographic and family background variables conform to the well-established pattern. For example, we estimate that if the head of a young male's household (usually, his father or mother) has a high school diploma, the young person's probability of graduating high school is raised by 17 percentage points. If the household head has graduated from college, the effect is about the same. The effects of parental education on the graduation prospects of young women appear to be somewhat less dramatic. The effects of having a household head receiving welfare, and of living in a household with two parents, are about the same for both males and females. All of those variables are found to be highly statistically significant.

There are two neighborhood variables in our model: the percentage of families in the neighborhood that are poor and the percentage of adults in the neighborhood who have a

Estimated Effects of Family and Housing Factors on High School Completion

Variable	Measure	Males		Females	
		%Effect	z-stat	%Effect	z-stat
<i>Family Variables:</i>					
Income	\$1,000	0.18	2.60	0.03	0.57
Head HS Diploma	Yes/No	17.48	6.55	5.43	2.66
Head College Diploma	Yes/No	16.37	5.07	8.46	2.91
Head on Public Assis	Yes/No	-13.91	-3.69	-12.92	-4.30
Two Parents	Yes/No	7.47	2.53	6.71	2.82
Employed Members	Number	-3.29	-2.02	-0.50	-0.39
<i>Demographic Variables:</i>					
Black	Yes/No	-8.41	-2.17	-1.60	-0.54
Puerto Rican	Yes/No	-4.93	-1.07	1.24	0.37
Other Hispanic	Yes/No	-4.51	-1.06	-2.48	-0.70
Asian	Yes/No	-0.59	-0.11	-2.35	-0.55
Age	Years	6.23	4.78	2.90	2.88
<i>Housing Variables:</i>					
Neighborhood Poverty	Percent	0.07	0.61	-0.11	-1.27
Neighborhood BAs	Percent	0.06	0.54	0.23	2.08
Homeowner	Yes/No	8.30	2.48	3.54	1.32
Overcrowded Unit	Yes/No	-10.98	-3.33	-6.37	-2.76
Maintenance Defic	Number	-1.22	-1.68	-0.92	-1.80
Teenage Move	Yes/No	0.74	0.27	-10.78	-4.11
<i>Sample Size</i>		1133		1115	

Note: The % effect represents the marginal effect on high school graduation of a one unit change in the control variable, evaluated at the mean of the independent variables. For binary variables, the evaluated change is for a discrete change from 0 to 1.

A Local Contribution

CHPC researchers have been studying the interaction of housing conditions and educational attainment among New York City residents. The rich housing and demographic detail of the city's Housing and Vacancy Survey (HVS) allowed us to explore a variety of housing and neighborhood factors affecting the chances of young people completing high school.

From the 1991, 1993 and 1996 surveys CHPC extracted a sample of 2,268 females and 2,107 males ages 19 to 22.

college degree. Our regressions indicate that they are insignificant predictors of a boy's high school graduation but that they may have an effect on a girl's. For females, the higher the proportion of neighbors with college degrees, the more likely she will be to complete high school.

Some useful information is not available from the HVS. Specifically, the HVS provides no data on the quality of schools the youths attended. That omission should only bias our results if school quality varies systematically with housing conditions. The inclusion of the neighborhood poverty and education measures serves to control for such a possibility. We also tested several other variables that could proxy for school quality and none of them displayed statistical significance.

CHPC also analyzed several housing variables and in general found them to have significant effects on high school completion. Consistent with the conclusions of other studies, we found a positive and statistically significant effect of home ownership on graduation rates. For males, the estimated effect is about 8 percentage points while for females it is about half that large. The result for females does not, however, meet the usual criteria for statistical significance. Several explanations have been offered for the homeownership effect on children's education. A family's homeownership may affect the aspirations and expectations of a child and perhaps make them feel more invested in their educational obligations. Or owned homes may simply be more spacious and comfortable, contributing to better study habits. Some researchers also believe that the effect is attributable to unmeasurable parental characteristics. For example, homeowners may be more willing to invest in the present for benefits in the future, a personality trait which shows up in their children's attitude toward schooling. In several previous studies, the homeownership effect persisted even with controls for parental attitudes.

One additional reason homeownership is believed to contribute to kids' educational achievement is that homeowners are less mobile than renters. As discussed above, residential mobility has been found by researchers to be harmful to children's education. Our analysis measured directly the effects of mobility. We found that a change of residence is negative for adolescent girls but insignificant for boys. For females, our measured effect is over 10 percentage points, which may indicate differences in the ease with which teen girls and boys are able to adjust to new peer groups.

We also obtained large and negative effects for the crowding variable. We defined an overcrowded dwelling as one in which there is more than one person per room. According to our estimates, crowding reduces young males' prob-

ability of completing high school by almost 11 percentage points, and reduces females' by about 6 percentage points. While it is easy to imagine how overcrowding can impair the development of a child's study habits, we explored this issue through several alternative specifications of our model. There are prior research results which indicate that family size, per se, has a negative effect on educational attainment. Our investigation indicated, however, that family size only matters when combined with crowded conditions. The issue requires further study, but our results indicate that at least some of the large-family effect on education could be the result of crowded housing conditions.

CHPC also evaluated the effect of housing quality on educational attainment. Our measure was the number of deficient maintenance conditions present within the unit. The effects were found to be negative and statistically significant for both males and females, and indicates that the probability of graduating high school drops by about 1 percent with each additional maintenance condition. We do not recommend, however, that the finding be interpreted too literally. Rather, the number of maintenance deficiencies should be thought of as an indicator of the overall physical quality of the dwelling unit. The results then indicate that the physical condition of the home affects the educational performance of the children living there, perhaps by affecting their health and school attendance or by affecting their comfort and ability to concentrate on academic challenges. Our results indicate to us that further exploration of the connection between substandard housing and educational achievement is warranted.

Elusive Variables

CHPC's research results indicate that the housing conditions in which young people live do indeed effect their educational attainment. In fact, inclusion of the set of housing variables causes most of the statistical differences in graduation rates among young people of different ethnicities to evaporate. Moreover, our findings are consistent with other research that indicates that the home and community environments can affect educational outcomes.

One statistical concern is that if families who live in crowded or substandard housing, or are unusually mobile, differ in some unobservable way from similar families who enjoy better and more stable housing circumstances, our results may be biased. The instrumental variables technique for controlling for that possibility requires a variable that is correlated with housing circumstances but not with educational attainment. Finding such a variable is extremely difficult. We will continue to explore refinements by that and other methods, but ultimately the reader must judge whether the body of evidence is convincing or not.-- *Frank Braconi*