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Neighborhood effects on secondary school performance of Latino and African American youth: Evidence from a natural experiment in Denver

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ABSTRACT

We quantify the relationships between measures of neighborhood context and school performance (repeating a grade, grade point average and dropping out before a diploma is earned) for low-income Latino and African American adolescents ages 12–18. We employ administrative and survey data from a natural experiment involving the Denver Housing Authority's public housing program to minimize geographic selection bias and provide wide variation in neighborhood contexts. We use characteristics of the neighborhood initially offered by DHA to waiting list applicants as identifying instruments for the neighborhood context experienced as an adolescent. Cox proportional hazard models (OLS in the case of grades) demonstrate that neighborhoods having less social vulnerability, higher occupational prestige and lower percentages of African American residents robustly predict superior secondary educational performance in one or more dimensions, though magnitudes are typically contingent on ethnicity.

1. Introduction

Improving the educational outcomes for low-income, minority youth has been a longstanding goal of U.S. educational policy. Although the importance of home and school environments in shaping educational outcomes is undeniable, increasing social scientific attention has been devoted to investigating the degree to which neighborhood context also exerts a substantial, independent influence. The two core challenges facing such investigations are that (1) typically there is little variation in the contexts in which low-income minority children are raised, "therefore we do not often get the chance to observe how a more advantaged environment might affect their lives;" and (2) "families choose neighborhoods… they are not randomly distributed across social settings" (DeLuca and Dayton, 2009, p. 458).

We aim to overcome these challenges by leveraging a natural experiment involving the Denver (CO) Housing Authority (DHA), which since 1969 has operated public housing units located in a wide range of neighborhoods throughout the City and County of Denver. Because (as we elaborate below) DHA's offer of a dwelling (and, thus, a neighborhood) to a household at the top of the DHA waiting list mimics a random process, this program represents an unusual opportunity for both reducing location selection bias and often observing the unusual circumstance of low-income minority youths raised in good neighborhoods.

In this study we analyze data from administrative sources and data we have collected from telephone surveys with Latino or African American current and former DHA tenants whose children lived in DHA housing during all or part of their adolescence. Our surveys provide retrospective information on a battery of family characteristics and a variety of interrelated secondary school outcomes.

Our primary research question involves identifying the magnitude of context effects as operationalized by several neighborhood indicators:

> For Latino and African American youth age 12 and older who spent some of their adolescence living in DHA housing, are there statistically and economically significant differences in their grades and hazards of repeating a grade and dropping out

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of school attributable to differences in their neighborhood environments, all else equal?

From the perspective of urban educational policy, we are investigating the degree to which an assisted housing policy can produce sufficient changes in the developmental context of low-income minority youth to yield substantial educational payoffs.

Our work advances this literature in four ways. First, because caregivers of our sampled children were quasi-randomly offered neighborhoods, the potential influence of geographic selection bias is reduced. Second, we further limit the potential selection bias that may occur after initial offer by employing as instruments neighborhood characteristics associated with the dwelling first offered by DHA. Third, we evaluate an unusual variety of measures of neighborhood environment related to socioeconomic status, ethnic and nativity composition of residents, housing age and tenure, and safety. Fourth, we assess the potential heterogeneity of relationships across several dimensions and test for nonlinear relationships; in particular we are one of the few studies to examine neighborhood impacts on the secondary school performance of Latino youth.

2. How neighborhoods might affect youth educational outcomes

Our theoretical framework for studying links between neighborhood contexts and children and youths' outcomes draws most heavily from accepted ecological models of human development, which emphasize the need to examine developmental context. This perspective sees children's development being shaped by the proximal (e.g., family) as well as distal (e.g., neighborhood) contexts in which children live and interact (e.g., Bronfenbrenner and Morris, 1998). Neighborhood context may affect children through a variety of causal mechanisms that can occur either through economic, social, institutional, or biological processes; for extended discussions see Jencks and Mayer (1990), Leventhal and Brooks-Gunn (2000) and Galster (2012). The potential mechanisms relevant for educational outcomes include: peer influences, socialization and social control, violence and social disorder, institutional resources, market incentives, stigmatization, environmental health, and parental mediation. Because these mechanisms are well-known, we describe them only briefly:

Peer influences: Youth may develop and modify attitudes, values, behaviors and expectations about school as a result of interactions with neighborhood peers (Case and Katz, 1991). These peer effects may be transmitted among youth in a contagion-like fashion (Crane, 1991).

Socialization and social control: Youths' attitudes, values, behaviors and expectations about school may be shaped by neighborhood adult role models and norms enforced by the community or local culture (Wilson, 1987; Connell et al., 1997).

Violence and social disorder: Exposure to neighborhood violence may lead to adverse physical responses (like ill health from stress), psychological responses (like post-traumatic stress syndrome) and impediments to speech communication, all of which impede school performance (Sampson et al., 2008).

Institutional resources: Public and private institutions controlling services and facilities (especially schools, after-school tutoring, etc.) vary in their quantity and quality on the basis of neighborhood context, thereby differentially affecting youths' perceptions of the value of educational attainment and their access to resources that can enhance performance. Neighborhoods may also affect the socioeconomic and behavioral composition of local schools to the extent that they determine attendance zones, thereby shaping the peer influences to which teens will be exposed in the classroom (Hoxby, 2001; Lavy et al., 2009).

Market incentives: Neighborhoods may promulgate different economic incentives that can influence educational outcomes. For example, disincentives for academic performance may ensue if local illegal drug markets seemingly offer more lucrative income-earning potential than legal labor force activities requiring superior educational credentials. Youth from areas with poor geographic access to job opportunities may undervalue educational attainment since they see little prospective economic value from it (Anderson, 1999).

Stigmatization: Prospective employers may negatively evaluate job applicants from certain locales based on the bad reputation of the place. This, perhaps in combination with accessibility, may lead youth from these areas to undervalue educational attainment (Bauder, 2001).

Environment and health: Neighborhood-based variations in exposure to ambient noise, toxins, lead, or other pollutants can affect cognitive and behavioral development and the severity of school absences due to asthma and other diseases, thereby affecting student achievement (Acevedo-Garcia et al., 2003).

Parental mediation: Variants of the aforementioned neighborhood mechanisms may also affect the physical and mental health, attitudes, behaviors, and resources of parents. These indirect neighborhood effects may be transmitted to children inasmuch as they affect the parents' willingness and ability to assist, monitor, and enrich their children's educational experiences (Connell et al., 1997; Leventhal and Brooks-Gunn, 2000) or deter other behaviors that interfere with their educational achievement (Bellair and Roscigno, 2000).

Although there is a smattering of evidence to support several of the neighborhood effect mechanisms described above, there is no consensus as to which mechanism(s) may dominate for educational outcomes. Indeed, this remains a critical realm of future research (Harding et al., 2011; Galster, 2012). With our breadth of neighborhood indicators we hope to contribute to a better understanding of these mechanisms, though we acknowledge that there is no one-to-one correspondence between an indicator and a causal process, as we amplify below.

3. Measuring the independent, causal effect of neighborhoods: challenges and responses in the empirical literature

An educational outcome of interest (O) observed at time t for individual youth i residing in neighborhood j in a particular metropolitan area can be expressed:

$$O_{it} = \alpha + \beta[C_{it}] + \gamma[C_i] + \delta[P_{it}] + \zeta[P_i] + \theta\left[N_{jt}\right] + [UC_{it}] + [UC_i] + [UP_i] + [UP_{it}] + \left[UN_{jt}\right] + \varepsilon \quad (1)$$

where

- $[C_t]$ = observed characteristics of youth that can vary over time (e.g., past trauma, number of siblings in the home);
- $[C]$ = observed characteristics of youth that do not vary over time (e.g., race, year and country of birth);
- $[UC_t]$ = unobserved characteristics of youth that can vary over time (e.g., psychological states, interpersonal relationships);
- $[UC]$ = unobserved characteristics of youth that do not vary over time (e.g., genetic makeup, pre-natal experiences);
- $[P_t]$ = observed characteristics of youth's parent(s) that can vary over time (e.g., marital status, income);
- $[P]$ = observed characteristics of youth's parent(s) that do not vary over time (e.g., race, year and country of birth);
- $[UP_t]$ = unobserved characteristics of youth's parent(s) that can vary over time (e.g., psychological states, interpersonal relationships, self-efficacy);