

“Cumulative Advantage in the Intergenerational Transmission of Education: Quantities and Qualities”

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Introduction and Overview. The transmission of educational attainments has been a question of interest to scholars since at least the early part of the last century (Sorokin 1927) and was the basis of a watershed in sociology (Blau and Duncan 1967). In recent years, economists have also taken piqued interest in the topic (e.g., Black et al. 2005; Sacerdote 2002). Both disciplines have neglected major changes in the U.S. postsecondary educational system potentially related to intergenerational educational inequalities, however. Beginning in the 1960s, the postsecondary system experienced phenomenal growth in enrollment and increased institutional differentiation (U.S. Department of Education 2007; Baker and Velez 1996). In tandem with these changes, scholars note differential economic and social returns to individual’s education, not only by years of education but by the *kind* of postsecondary education (Black and Smith 2004; Kane and Rouse 1999; Grubb 1993). Given the importance of qualitative dimensions of education for individual outcomes, these differences may have implications for future generations as well. Indeed, differences in the qualities of an individual’s education may underlie important group differences observed in the intergenerational transmission of years of education (Long et al. 2005; Maralani 2007). I use national data for mother-child pairs from the NLSY79 to explore how these different dimensions operate in the intergenerational transmission of education by key social groups. Specifically, I use stereotype and other discrete outcome models with latent variables to explore the effects of various types and levels of mother’s education on the various types and levels of their children’s education.

Research on the Intergenerational Transmission of Education. With increasing frequency, scholars have explored the intergenerational transmission of education. The sociological literature on the topic stems from early work by Blau and Duncan (1967) illustrating a “perverse equality” whereby the children of highly educated Blacks do not receive the same benefits from their parents’ education as white children of similarly educated parents. Sociological interest in the intergenerational transmission of education has been revived of late by Gamoran’s (2001) forecast that Black-white inequalities in education attainments would disappear by dint of improved socioeconomic status among Black. Recent research by Long et al. (2005) using the General Social Survey suggests this forecast is highly suspect; race-ethnicity continues to play an important role in the intergenerational transmission of years of education in contemporary U.S. society. Maralani (2007) presents similar findings using the Panel Study of Income Dynamics, illustrating marked Black-white differences in the intergenerational transmission of mother’s education at higher levels of education.

Economists have suggested low levels of intergenerational transmission of education may offset increases in individual wage inequality since the 1970s because such inequality would represent arguably meritocratic processes based more on

individual attainments than on family endowments (Gottschalk 1997). With varying degrees of success, education economists have used a variety of regression techniques to randomize parent-child pairs and thereby derive the causal effect of parent education on child education net of unobserved characteristics. By and large, this body of research has produced conflicting results using data from developed countries. Black et al. (2005) use a policy change in compulsory schooling in Norway and variation across municipalities in its implementation to identify the effect of a change in parents' education on their children; Sacerdote (2002) uses a sample of adopted children randomly assigned to their parents to instrument the effect of parents' education. Both find either a small effect (0.176 years) or no effect on children's educational attainment.

Other economic research finds stronger evidence of a causal relationship between the education of parents and their children, particularly for mother's education. For example, Oreopoulos et al. (2006) find an increase in parental education via changes in compulsory education in the United States lead to a decrease in the likelihood a child will be retained in grade. Chevalier (2004) also uses changes in compulsory education laws in Great Britain to identify the effect of parent's education on child's education and finds a large positive effect of mother's education.

Theoretical Framework. While evidence accumulates as to the extent of the intergenerational transmission of education, arguably little sociological theory has been brought to bear on the subject. Cumulative advantage theories provide a natural fit and analytic anchor by which to explore the intergenerational transmission of education. Different forms of cumulative advantage have been discussed in the literature, but all of these forms underscore persisting and typically growing (dis)advantage over time (DiPrete and Eirich 2006). In cumulative advantage theory, advantage may persist through the intergenerational transmission of status, thereby providing a stable regime by which virtuous or vicious cycles operate (Duncan 1968). In the cumulative advantage framework, inequalities in the intergenerational transmission of education largely derive from differential returns to similar statuses across different social groups of interest over time (DiPrete and Eirich 2006; Blau and Duncan 1967).

Karabel and Astin (1975) make an early argument that qualitative differences in educational attainment represent an important and often overlooked dimension by which educational advantage may accrue across generations. To my knowledge, no research has tested Karabel and Astin's (1975) argument for the importance of qualitative differences in the intergenerational transmission of education. This is particularly puzzling given the marked institutional differentiation and increasing enrollments and competition in the U.S. postsecondary system since the 1960s. Moreover, many educational policies emphasize qualitative dimensions of education and the intergenerational transmission of these dimensions. For example, affirmative action research in higher education has illustrated positive individual outcomes for students of color attending selective universities (Bowen and Bok 1998). However, affirmative action policies implicitly require the intergenerational transmission of these opportunities and the advantages associated with them in order to compensate for discrimination. Indeed, tangential evidence on a similar intergenerational policy in higher education—legacy policies privileging admission of alumni's children—suggests these policies *do* effect the composition of college attendees (Howell and Turner 2004).

Research Questions. The cumulative advantage framework invites a number of questions as to the importance of both qualitative and quantitative differences in educational attainment and the various mechanisms associated with them:

1. What is the causal relationship between quantitative and qualitative dimensions of parents' educational attainments and the educational attainments of their children?
2. Have these relationships varied over time as the educational system has expanded and changed?
3. Do socioeconomic and race-ethnic groups receive differential returns to various dimensions of educational attainment? Have these relationships varied over time?

Methods. In this paper, I employ a stereotype logistic regression model to answer the posed research questions. First expounded by Anderson (1984), DiPrete (1990) underscores the utility of this model for intergenerational research. The stereotype model provides a more parsimonious and efficient test of the relationships between a set of regressors and a set of categorical outcomes and allows for a complex classification of educational attainments that captures both quantitative and qualitative dimensions of education. There are clear parallels between the stereotype regression model and more standard log linear models in intergenerational mobility research. Both can describe the relationships between a set of independent variables and categorical outcomes. However, standard log linear models present estimation difficulties as the number of categorical outcomes increases and do not easily allow for the introduction of individual-level independent variables.

Ultimately, I am interested in the causal relationship between the quantitative and qualitative dimensions of parents' education and those of their children, but unobserved characteristics of the parents or their children may preclude strict causal interpretations. Previous economic research has employed various instruments to identify the causal effect of parents' education, including geographic proximity to postsecondary institutions and sibling fixed effects. These techniques are often of questionable value (see Taber 2001) and are not a viable strategy in this analysis due to data constraints. Alternatively, Holjund and Holm (2007) propose a stereotype regression model with a number of latent classes of individuals with potentially differing relationships between parents' and children's education. Despite some possible technical weaknesses, this strategy is the best option to address concerns over unobserved heterogeneity and to estimate the causal relationship between parents' and children's educational attainments in my analysis.

Data. I use data from the National Longitudinal Study of Youth 1979 on mothers and their young adult children in my analysis. The NLSY79 is a nationally representative sample of 12,686 men and women 14-22 years old when they were first interviewed in 1979. Respondents were interviewed annually through 1994 and are currently interviewed on a biennial basis. The study was expanded in 1986 to include interviews with all children of mothers in the NLSY79. In addition to detailed information on the social background and work and education attainments of the NLSY79 mothers, the study includes data on the development and educational attainments of their children. Private data includes sensitive information about the names and locations of colleges attended for each.

A limitation of these data is the composition of mother-child pairs. Many of these children in the NLSY79 are of relatively young mothers. For example, the mean age at first birth for a woman in 1979 when these data were first collected was 23 years. I have a sample of about 2200 children age 19 or older and eligible for post-secondary school, 757 of whom are born to mothers age 21 or older at the child's birth and 350 of who are born to mothers age 23 or older at the child's birth. The issue of a selective sample of mothers and children is aggravated for college completion. There are 1400 children age 21 or older in the sample and eligible for college completion, 278 of whom are born to mothers age 21 or older at the child's birth and 52 of whom are 23 years of age or older at the child's birth. However, these data remain the best source of information on the quantities and qualities of parent and child education attainments for a national sample of individuals.

Analysis Plan. I test my three research questions using stereotype regression models of different categories of children's educational attainment. The categorical outcomes for these models are based on a classification scheme that captures both quantitative and qualitative dimensions of educational attainment. I focus on a bachelor's degree as the highest level of education in my models because of increasing labor market returns for this credential even as inequalities in its attainment have persisted (Gottschalk 1997; U.S. Department of Education 2007).

Independent variables are entered sequentially in the order described here. I begin with dummy measures for 5-year birth cohorts of the child and of the mother, sex of the child, race-ethnicity of the child and mother, both parents' years of education, both parents' occupational statuses, family income, number of siblings, and household structure. Race-ethnicity dummies include measures for Black and for Latino. Income will be measured in the log of 2007 dollars. Number of siblings ranges from zero to six or more and is treated as a continuous variable. Household structure is denoted by a dummy measure of whether the child resided with both biological parents until at least age 16. Therefore, white males from two-parent homes will serve as the reference category. I then add qualitative measures of the mother's education: dummy variables denoting whether the mother earned a credential from a two-year institution, a four-year institution, or a selective four-year institution; and the number of regular postsecondary institutions attended.

To address the second research question, I introduce interaction terms between the mother's birth cohort and the mother's years of education. These terms measure the extent to which the effects of quantitative dimensions of education differ across time. Then, I add interaction effects between the mother's birth cohort and remaining qualitative measures of her education. In doing so, I learn whether the effects of these qualitative dimensions of mother's education have changed over time and their relative importance vis-à-vis a quantitative measure of years of education for children's educational attainments.

To address the third question, I specifically test whether key social groups experience differential returns to the two dimensions of mother's education attainment. I enter three-way interaction terms between race-ethnic and socioeconomic groups and the mother's educational attainments and the main trend terms. In doing so, I ascertain which dimensions of mother's education affect the educational attainments of their

children and how they differ by race-ethnic and socioeconomic groups over time. Because the data span several birth cohorts, I can assess the extent to which these interaction terms suggest whether possible differential returns increased, decreased, or remained stable by both quantitative and qualitative dimensions for minority parents and their children as affirmative action policies matured and changed over time.

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