Intergenerational Mobility

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Abstract

This essay describes basic facts about intergenerational mobility as well as some of the mechanisms that have been proposed to explain levels of mobility or persistence of socioeconomic status across generations. Limits of current research are identified.

INTRODUCTION

Intergenerational mobility refers to the degree to which individual socioeconomic characteristics are associated with the outcomes and characteristics of their parents. Mobility can thus be either absolute or relative.

MEASUREMENT

Economics and sociology have traditionally focused on income and occupation, respectively, in measuring intergenerational mobility. Contemporary social science includes theoretical and empirical studies of mobility that account for the persistence of socioeconomic phenomena such as education, occupations, family structure, and criminal activity.

The standard measure of intergenerational persistence of income is the intergenerational elasticity (IGE) of offspring's income with respect to parental income. If the variance of the income distribution in two generations is the same, the IGE will be the same as the intergenerational correlation of the logarithms of incomes. If the variance of the income distribution has changed, then the IGE will be the intergenerational correlation weighted by ratio of variances in the two generations. Both elasticities and correlations intergenerational mobility have been widely used in literature (Black & Devereux, 2011). The use of logarithm of income reflects the objective of measuring mobility after accounting for secular income growth in a society. Because of relatively limited labor force participation of women, most studies look at the relationship of incomes of fathers and sons. We focus on the IGE as it is the more commonly used measure.

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It has recently been claimed that countries that have higher cross-sectional income inequality tend to have a lower rate of intergenerational income mobility; this relationship is often called *The Great Gatsby Curve* (Corak, 2013). It does not necessarily imply causality from inequality to low mobility or vice versa. Among the OECD countries, during the mid-1980s, Finland, Sweden, Norway, and Denmark were the most equal in terms of income distribution, whereas the United States and the United Kingdom the most unequal. Intergenerational income mobility is found to be higher in the Nordic countries and lower in the United Kingdom and the United States. Low IGE for Nordic countries can be explained either by low return to skills resulting in compressed income distribution, or higher reliance on distributive social and educational policies (Black & Devereux, 2011).

Surveys of IGE of select countries gives some perspective of the magnitude of cross-country differences in income mobility. Jantti *et al*. (2006) found that the IGE was 0.071 in Denmark, 0.306 in the United Kingdom, and 0.0517 in the United Status. They find that larger IGE in the United Status and United Kingdom relative to that in the Nordic countries was almost entirely due to the differences in the tails of income distribution. South America, other developing countries, and the Southern Europe also have high degree of income inequality and intergenerational income mobility (Blanden, 2013). Some of the estimates for the IGE in other countries include 0.4 for France (Lefranc & Trannoy, 2005), 0.5 for Italy (Piraino, 2007; Mocetti, 2007), and 0.52 in Brazil (Dunn, 2007).

There is a growing public perception in the United States that the IGE has been declining in recent decades. However, the empirical evidence on the trend in IGE has been mixed. Some studies have found that income mobility has declined in recent decades (Aaronson & Mazumder, 2008; Putnam, Frederick, & Snellman, 2012), whereas other studies have found no trend in income mobility (Hertz *et al*., 2007; Lee & Solon, 2009). Furthermore, due to the difficulties in measuring permanent income accurately, different studies have estimated vastly different magnitudes of IGE, while using different data sources and different income aggregation methods for the same cohorts. Estimates of the IGE in the United States for the cohorts of children born in the 1950s and 1960s include 0.2 (Behrman & Taubman, 1985), 0.4 (Solon, 1992), and 0.6 (Mazumder, 2005).

Chetty, Hendren, Kline, and Saez (2014) analyze intergenerational mobility in the United States for the last three decades using the universe of actual tax returns filed. The authors measured intergenerational mobility based on the correlation between parental and child's income percentile ranks rather than the IGE between their actual incomes. By looking at the mobility measures of the 1971 and 1993 birth cohorts, they conclude that the rank-based measures of intergenerational mobility have not changed significantly over recent

decades. Meanwhile, the authors find that the cross-sectional inequality has increased during these years, but this increase came from the extreme upper tails of the income distribution. The authors estimate that the rank-rank based measure of intergenerational income elasticity is 0.3, half of the estimate found by Mazumder (2005) using data for the same years. Differences in these estimates stem primarily from the fact that Mazumder did not have the information for the parental incomes for 60% of observations in his sample and had to impute it using education and race. Meanwhile, Chetty *et al*. (2014) use direct measures of parental income.

Analysis in Chetty, Hendren, Kline, Saez, and Turner (2014) uncovered substantial spatial heterogeneity in intergenerational mobility rates across the United States. They find that intergenerational mobility is strongly correlated with the several factors: (i) residential segregation, (ii) income inequality, (iii) school quality, and (iv) family structure. Comparing intergenerational mobility measures across the commuting zones in the United Status, intergenerational mobility appears to be lower in the areas characterized by higher residential segregation, high income inequality, lower school quality, lower rate of engagement in the community organizations, and higher share of children living in single-parent households. It reasons to be seen if these relationships are causal.

Intergenerational income elasticities (and correlations) can mask important features of the relationship in incomes across the generations as they measure a single linear relationship between incomes across generations. In particular, this single summary measure ignores differences in income mobility across different parts of the income distribution. Such measures cannot capture the possibility that the correlatedness of parents' and children's income differs by parental income. Some studies employ Markov Chains to allow for such nonlinearities (Bhattacharya & Mazumder, 2011; Chetty *et al*., 2014).

Linear measures of income mobility also do not take into account the fact that the family dynasties may differ by ethnicity, and the persistence of incomes across generations is partially the result of permanent differences in opportunities between families of different ethnic groups. Chetty *et al*. (2014) find that there is special variation across the United States in the rates of intergenerational mobility, and the mobility is significantly lower in the areas with the larger share of African-American population. They note that such areas tend to be more segregated both by income and race. Bhattacharya and Mazumder (2011) use a Markov chain approach to calculate the probability that an offspring's income falls in a higher percentile than a parent's and find substantially more upward mobility for whites than blacks.

Sociologists have a long history of studying intergenerational occupational mobility (Blau & Duncan, 1967; Sewell & Hauser, 1975). The extent of intergenerational occupational mobility can shed additional light on the extent

of intergenerational social and economic mobility. Hellerstein and Morrill (2011) looked at the correlation of occupations between parents and their children and found that in recent cohorts, 30% of sons and 20% of daughters worked in the same occupation as their fathers. Using a continuous measure of "occupation prestige," Ermisch and Francesconi (2002) find that the intergenerational occupational correlation in the British Household Panel Survey ranges from 0.4 to 0.75 between fathers and offspring, and from 0.30 to 0.50 between mothers and offspring. The authors also find that the effect is nonlinear, and that families of higher socioeconomic status have higher elasticity. Corak and Piraino (2010) analyze Canadian data, and find that by the age of 30, about 40% of men have worked for the same firm that had previously employed their father. This correlation was stronger for higher income earning fathers.

There is empirical evidence of intergenerational correlation of the welfare receipt, but the economic literature has not found clear evidence of the causality of the welfare receipts of parents on the welfare receipts by children. Levine and Zimmerman (1996) exploit the variation of the welfare receipts across states to identify the presence of the Welfare Trap—the mechanical correlation of the means-tested welfare policy that leads to the correlation of the welfare receipts between parents and children. They do not find the evidence of such welfare traps, and conclude that most of the correlation in the welfare receipts is attributable to the correlation in income.

Correlation of parental and child's income across generations could conceivably be partially the result of the intergenerational transmission of attitudes. Some authors have examined the transmission of attitudes and social behavior across generations. Dohmen, Falk, Huffman, and Sunde (2011) show that the willingness to take risks and the extent of trust are correlated across generations in Germany. Altonji and Dunn (2000) find that the intergenerational persistence of hours worked are primarily due to the intergenerational persistence of work preferences.

MECHANISMS

What sorts of mechanisms determine intergenerational income mobility? We highlight four types of explanations that have received much attention.

Family Transmission Models

For economists, the impact of family income on the educational attainment of children is a natural way to explain intergenerational income patterns. This perspective reflects the importance of human capital in economic attainment. Becker and Tomes (1979) and Loury (1981) have proposed the

classical intergenerational mobility models. These models have a common logical structure. Parents invest in their children by "purchasing" education. Since parents cannot legally obligate their children to pay for educational loans, parental income determines the level of investment. Since human capital, in conjunction with ability and labor market luck, determine the offspring's income, a potential causal relation exists between parental income and child's income.

The frontier in understanding family and other influences on individuals moves away from equating human capital with formal education toward a broader conception of cognitive skills and personality traits. The focus is on the key personality traits ("the big five" of psychology): openness, conscientiousness, extraversion, agreeableness, and neuroticism. Research on the importance of personality traits, commonly called *noncognitive skills*, in determining socioeconomic success has been pioneered by James Heckman. Borghans, Duckworth, Heckman, and ter Weel (2008) and Almlund, Duckworth, Heckman, and Kautz (2011) are comprehensive surveys.

Studies have shown that there are critical and sensitive periods in the technology of human capital formation and different capacities are malleable at different stages of life (Cunha, Heckman, Lochner, & Masterov, 2006). For instance, IQ is rank stable after the age of 10, whereas personality skills are malleable through early adulthood. Besides, there is a dynamic complementarity across both cognitive and noncognitive skills. Better noncognitive skills, such as self-control, self-confidence, and discipline, help future investments in cognitive skills be more productive. Higher stocks of skills help beget more skills (Heckman, 2008). Thus, credit constraints for parents of the very young are potentially important as they may limit the ability of parents to provide such an environment.

In addition to providing human capital, family income has also been linked to "health capital." The "Fetal Origins" hypothesis argues that there is the effect of prenatal environment (health of the mother) on subsequent human capital formation of children (Currie & Almond, 2011). If parental income helps determine parental health (a relationship that is well-established), then it is possible that persistence in health status is the source of the transmission of income status.

There is indeed positive correlation between parental income and child's achievement, and many studies interpret this correlation as evidence that parental credit constraints impede investment in children. However, empirical evidence on the importance of credit constraints for human capital formation is not conclusive. Heckman and Mosso (2014) survey literature on determinants of human capital and find that the importance of credit constraints in shaping child outcomes are exaggerated in recent literature compared to the importance of parenting and mentoring.

Social-Level Transmission Models

A second approach to understanding intergenerational mobility focuses on social influences on children and adults. Social influences, abstractly, refer to influences which act on individuals via some collective activities or environments. To understand what we mean, consider education. For most American children, education between 5 and 17 is publically provided without direct charge. Education, in other words, is a public good whose level is determined by a political mechanism and depends on the incomes and preferences of the adults in the school district (as well as any other levels of government that provide funding for the schools).

How does parental income matter for publically provided education? The answer is that parental income is one of the factors which determine which school a child attends. For public schools, it is of particular interest to gauge the extent to which equilibrium house prices and rent levels sustain stratification of communities by income. Models of neighborhoods and intergenerational mobility have been developed by Bénabou (1996a, 1996b), Durlauf (1996a, 1996b), and Hoff and Sen (2005), among others. The Durlauf models explicitly mimic those of Loury (1981) and Becker and Tomes (1979) and show how persistent income inequality between family dynasties can be produced.

One can identify a range of reasons why neighborhoods function as intergenerational transmission mechanisms. One reason may involve role models. If the education decisions of the young (effort in schools, years of schooling completed) are determined by perceptions of future economic benefits, the assessment of these benefits may depend on the distributions of educational levels and incomes observed in a community. Stratification of communities according to income will correspondingly mean that different locations produce different inferences about the value of education. This mechanism is formalized in Streufert (2000).

A second reason involves the influence of self-identity on individual choices (Akerlof & Kranton, 2000, 2002). Suppose that one effect of educational choices by an individual concerns how he relates his own identity to that of others in his community. In a community where few parents are well-educated, high education can render an individual feeling alienated from those with whom he wants to share an identity. This argument has been of long-standing importance in understanding racial inequality as a number of authors have argued that black educational attainment is hampered by the perception that academic success is a form of "acting white" (Fryer & Torelli, 2010; Ogbu & Davis, 2003). Durlauf (2004) is an overview of neighborhood effects.

The third reason that neighborhoods can affect the transmission of socioeconomic status is through providing access to information about employment

opportunities. Access to information about job openings can be low in a disadvantaged community because the disadvantage of each individual (e.g., because of unemployment) means that information is simply not available. Bayer, Ross, and Topa (2008) provide empirical evidence of the importance of interpersonal hiring networks for job market outcomes. Calvo-Armengol and Jackson (2004, 2007) provide the theoretical framework illustrating how the social structure could affect the wage inequality and employment participation of individuals belonging to different groups. Neighborhoods models illustrate an important feature of social poverty traps, namely that it is the interplay of strong social effects as well as the existence of distinct social environments that affects mobility. In other words, the social provision of education creates intergenerational persistence because communities stratify by income. This leads to a "memberships" theory of intergenerational mobility (Durlauf, 1996c, 1999, 2006) in which various group memberships can explain the transmission of advantage and disadvantage across generations. This idea independently appears in Massey (2007) who terms it *categorical inequality*.

Genetic Transmission

A third source of intergenerational persistence of socioeconomic status is via genes. Obviously, if an individual's genotype affects socioeconomic outcomes, then genes can create an intergenerational persistence in these outcomes. In his study of the multigenerational persistence of surnames in institutions such as elite colleges, Clark (2014) not only argues that parent/offspring persistence is far higher than found in IGE or Markov Chains, but reflects some latent factor he calls moxie which, given his discussion, is plausibly interpretable as genes. Empirical claims on the importance of genes in inequality, however, are derivative from studies of genes in intelligence, which is then linked to income. How is the genetic component of intelligence measured? Behavioral genetics performs decompositions of the variance of some characteristic or outcome, such as IQ into distinct roles for nature and nurture. Jensen (1969) claimed that 80% of the variance in IQ scores is genetic, launching a vast and continuing literature. Genomic data has been used to claim that 50% of variation in IQ can be described by measured variation of SNPs (single nucleotide polymorphisms) (Davies *et al*., 2011).

In our judgment, there does not exist a strong basis for authoritative statements about the role of genes in intergenerational mobility. Clark's work may be rationalized by genes, but there is no basis for privileging genes over institutions. (The British monarch is determined by genes, but the rule of

succession is an institution.) Measurements of a genetic component to variation in IQ (or any other trait) are typically based on the studies of twins' data, and exploit differences in correlations of traits between monozygotic and dizygotic twins. As argued by Goldberger (1979), many of these decompositions assume that family environment and genes are uncorrelated. This is clearly an untenable assumption. To see how it matters, note that the evidence for the role of genes is derived from higher correlations between monozygotic twins than dizygotic ones with respect to IQ or some other measure. If parents adjust childrearing to a child's genotype, then the shared family influence for monozygotic twins may be higher than that for dizygotic ones. This problem is not resolved by genomic studies which employ algorithms to isolate individuals with relative little DNA overlap such as Davies *et al*. (2011).

To be clear, behavioral genetics research has fully recognized the importance of gene/environment interactions. Studies such as Neiderhiser and Lichtenstein (2008) and Narusyte *et al*. (2008) look at the correlations between children of twins and suggest strategies to allow for gene/environment correlations. See Johnson (2013) for nuanced views on how work on intelligence should proceed. Our argument is that currently the magnitude of the role of genes is simply unknown.

Assortative Mating

A fourth explanation, which is linked to each of the previous explanations, concerns marriage patterns. Assortative mating, with respect to income, education, or other factors which affect children, can naturally enhance intergenerational persistence. Early efforts to quantify the implications of assortative mating for inequality led to disparate conclusions, see Kremer (1997) and Fernandez and Rogerson (2001). Recently, Greenwood, Guner, Kocharkov, and Santos (2014) have performed a detailed calibration analysis of a socioeconomic environment which shows how assortative mating can have first-order effects on cross-section inequality, which, given factors such as credit constraints, can translate into intergenerational mobility. A promising topic, in our view, is the role of assortative mating by ethnicity and persistent inequality across ethnic groups, see Kalmijn and Van Tubergen (2010) for a study of intermarriage patterns.

There is no systematic account that addresses the relative salience of these different mechanisms. A few analyses attempt to decompose the IGE as derivative from distinct channels. Bowles and Gintis (2002) employ a linear system of equations to decompose a 0.32 IGE of the United States as the sum of four underlying mechanisms that link parents and children: IQ conditional on schooling (treated as a proxy for genes) 0.04, education

conditional on IQ 0.07, wealth 0.12, and personality and race 0.07. Blanden, Gregg, and MacMillan (2007) engage in a similar exercise for the United Kingdom. While suggestive, these analyses, in our judgment are limited by their mechanical nature. By this, the decompositions do not derive from behavioral models, but from ad hoc modeling choices of the linear system. Nor do they address social mechanisms. That said, these studies are very original and should be the basis for future work.

WHY DOES INTERGENERATIONAL MOBILITY MATTER?

Intergenerational mobility is commonly regarded as a measure of the degree of equality of opportunity in a society, although rigorous philosophical formulations of equality of opportunity (e.g., Roemer, 1998) focus not on the degree of similarity between parents and children, but rather on whether high (or low) similarities are due to factors for which individuals are responsible. In other words, intergenerational mobility measures focus on outcomes, rather than mechanisms, which are the relevant objects in ethical evaluations of observed mobility patterns. A rare effort to explicitly measure equality of opportunity is Bjorklund, Jantti, and Roemer (2012).

FUTURE DIRECTIONS

While there are rich research literatures on the measurement of intergenerational mobility as well as on the various mechanisms that are believed to play major roles in determining rates of mobility, there does not exist an integrated analysis of intergenerational mobility which combines these mechanisms into a unified structure. As indicated by the work on early childhood development, identity, and social interactions, such a unified model must blend elements of neuroscience, psychology, sociology, and economics. While a daunting task, an integrated framework is essential in the identification of efficacious policies to promote mobility.

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