

Intergenerational Gains in Educational Attainment: How Do Rural Brazilians Fare after Education Reform?

This study analyzes educational change across generations within families as a function of earlier generations' level of education and other family characteristics that have been hypothesized to impact educational attainment. We investigate this question using rare longitudinal data collected within a rural population that allows us to analyze educational gains across three generations within families along the Transamazon Highway near the city of Altamira, Pará, Brazil. This research focuses on the effects of family background in the contexts of an expansion of the educational system following constitutional reform in the late 1980s and more recent conditional cash transfer programs that have incentivized education.

Brazil in Comparative Perspective

Brazil's primary and secondary education system has traditionally been characterized by unequal access to basic education, poor public school quality, and an extreme duality between private and public schooling (de Barros et al., 1993). Historically, both government and private funding have been channeled into private, not public, schools (Gadotti, 1992). Educational gains have slowly been made since the 1960s. Behrman and Schneider (1996) document high primary school enrollment in 1965 but low secondary school enrollment, well below the mean rate for other middle-income countries. Secondary school enrollment rates rose by the late 1980s, but remained below other middle-income countries' means. In 1988, the Brazilian government included major education reform in its new constitution. Primary education became compulsory for children ages seven to fourteen; assistance to primary school students was provided in the form of school materials, transportation, food, and health care; the Constitution mandates that the State pay private school tuition to ensure primary school enrollment for children without access to public school; and it allows rural schools to organize their school year according to sowing and harvesting seasons (United Nations; Haddad, 1996). A 1996 amendment made primary education free at public schools. Since secondary education is also free in public schools, all children of demonstrated ability should have access to secondary education.

Haddad (1996) documents that by the mid-1990s, 50 percent of Brazilians still spent fewer than four years in school, but children in urban Brazil had a three year schooling advantage over their parents (Blom et al., 2001). By the late 1990s, education was more equally distributed and more urban workers had completed secondary school than in the early 1980s. Still, the returns to schooling fell drastically during this period for all education levels, and even more so for those who completed lower secondary school (Blom et al., 2001).

Lam's (1999) study using 1995 data for Brazil and South Africa—two countries exhibiting extreme income inequality—shows a strong relationship between parents' schooling attainment and their children's schooling. He finds a sharp contrast between South Africa and Brazil in the consequences of parental education: having uneducated parents limits children's prospects of educational advancement much more in Brazil than in South Africa. Schooling inequality is thus transmitted across generations less strongly in South Africa than in Brazil. In both countries, mean schooling rose at similar rates for cohorts born between 1930 and 1960, but Brazil's rate of mean schooling has grown much slower than has South Africa's for cohorts born after 1960. Lam's (1999) study thus reveals a unique disadvantage for Brazilians compared to comparable developing countries, and it shows the connection between unequal distribution of education and the intergenerational transmission of inequality. Other comparative studies of Latin American

countries plus the U.S. place Brazil either at the bottom (de Barros et al., 2009; Behrman et al., 2001) or at the middle of the ladder (Dahan and Gaviria, 2001) regarding intergenerational social mobility and timely grade completion.

Most recently, Brazil has implemented and then dramatically expanded a conditional cash transfer (CCT) program designed to keep children in school. Bolsa Escola, enacted in 2001, provided small monthly payments of about R\$25 (approximately \$10 at that time) to parents of poor children enrolled in primary school, representing a 20 percent income increase to recipient families. Parents were required to maintain high attendance records for their children in order to receive the monetary allowance (Souza, 2002). Bolsa Escola and other CCT programs are shown to partially improve enrollment rates (de Janvry and Sadoulet, 2005). Still, researchers observe a pattern of social reproduction tied to this CCT, whereby participating poor children whose parents have nine or more years of education recorded the highest enrollment rates, while children whose parents have fewer than four years of education did not benefit from Bolsa Escola at all. Other children who did not benefit are those whose parents work in agriculture, have no running water, live in overcrowded households, or live far from a secondary school (de Janvry and Sadoulet, 2005), exactly those in our study population.

Bolsa Família, enacted in 2003, merged Bolsa Escola with three other CCTs. One of the largest CCTs in the world, Bolsa Família provides poor families with children between R\$15 (almost \$10 at current exchange rates) and R\$95 in return for children's enrollment in primary school and regular health checkups (Soares et al., 2010). Researchers demonstrate that 94 percent of the funds help the poorest 40 percent of the population (Ministry of Social Development, 2006; World Bank, 2005). Soares et al.'s (2010) evaluation shows that, as of 2004, it positively impacted school attendance and dropout rates. However, these children were likelier to fail to advance in school, possibly because Bolsa Família may increase the number of underachieving students in school.

Dahan and Gaviria (2001) attribute half of the difference in schooling completion across families to family background and deem public expenditures on education only mildly associated with intergenerational social mobility. Others claim that public expenditures *are* associated with greater intergenerational mobility (Behrman et al., 2001). De Barros et al. (2009) calculate an educational opportunity index that shows great improvement in Brazil's educational opportunity between 1995 and 2005, and they attribute this improvement to successful implementation of public policies aimed at reducing educational inequalities (i.e., Bolsa Escola and Bolsa Família).

Theories of Educational Stratification

What explains these educational trends within Brazil and the observed divergences between Brazil and other developing countries? Macro-structural theories of intergenerational educational stratification focus on the state and national economy. The nation-state is viewed as determining access to education and the structure of the education system (Buchmann and Hannum, 2001), and the state is implicated in creating the dichotomy between public and private schooling (Gadotti, 1992). Since children from advantaged backgrounds have access to private schooling, we expect to see the greatest intergenerational gains from Brazil's education reforms targeting public school access among disadvantaged children. If we find such gains in educational attainment across generations in the migrant settler community that constitutes our sample, then it is plausible that state efforts to improve educational access have been successful. Macroeconomic theory stresses changes in the demand for skilled labor, often observed when societies shift from depending primarily on rural agricultural productivity to urban industry and

services. If employers are seeking highly skilled workers and more skilled jobs are available, then more families with lower education will invest in their children's education (Lillard and Willis, 1994). If this is the case, we should see a pattern of across-the-board gains from one generation to the next.

Microeconomic theories of the family focus on financial decision-making processes, such as decisions to keep children home to work due to monetary constraints or family labor needs (Buchmann and Hannum, 2001). They further anticipate that parents and their children consider costs, utility, and the probability of economic success via education versus alternatives when making educational decisions (Breen and Jonsson, 2005), pointing to the importance of considering the gendered nature of jobs available to each successive generation and the economic potential of farming in this context. Settler families are overwhelmingly dependent on farming, and have few assets beyond land and simple machinery. The family economy model holds that regardless of perceived returns to education, disadvantaged parents (such as many of our respondents) will not invest in education if doing so jeopardizes family welfare (Buchmann, 2000). We can examine the extent to which the CCT affecting the youngest generation of our data have mitigated this effect of extreme poverty in rural Brazil.

Status attainment theory from sociology, in contrast, focuses on the relative status of parents vis-à-vis their peers. It holds that children's socioeconomic status (SES) trajectories are overwhelmingly determined by their parents' relative rather than absolute level of disadvantage. In other words, SES persists between generations, whereby low SES individuals come from disadvantaged households, and high SES individuals come from advantaged households. Social stratification research identifies educational attainment as a major contributor to the intergenerational persistence of SES and of inequality (Buchmann and Hannum, 2001; Sewell and Hauser, 1975; Blau and Duncan, 1967). Within our data, we will be able to compare each individual family to its peers in each generation, being cautious about the possible sample selectivity bias of looking backward from current interviews. We can then see if disadvantage persists or if there is a reordering of families across generations.

Data Source, Analysis Plan, and Contribution

We use longitudinal survey data, collected collaboratively by researchers at Indiana University and the State University of Campinas, Brazil to analyze intergenerational educational attainment within a settler population in the Altamira settlement area, Pará, Brazil (Moran et al. 2005, VanWey et al. 2007). We use data from two waves of a survey to construct measures of education of three generations within each family. The first survey was fielded in 1997 and 1998, and the second in 2005. We overcome two common data deficits with this survey. Datasets containing educational outcomes for more than one generation of the same family are rare in Latin America. This survey collects years of education completed across three generations. Additionally, household surveys don't always specify whether or which children living in a household are children of the household head (Behrman et al., 2001). This survey specifies such relationships within households. In-person interviews with household heads enumerated all household members and their exact relationship to the household head, years of education completed, and the same information for all children of the female household head.

The three generations of these families are defined with the oldest, generation 1, being the household heads in 1997/98. In 2005, interviews were completed with all of these individuals who remained in the study area and alive, and with any of their children who had lived with them in 1997/98 and remained in the study area in 2005. These children are generation 2 and their

children (completed enumerated with information on completed education in the 2005 survey) are generation 3. We thus compare a generation born in approximately the middle of the 20th century to one born in approximately the 1970s and 1980s, and then to a generation born around the turn of the century. Thus, the first and second generations were born before the 1988 constitutional changes and CCT programs, while the third generation was born and/or educated after these education reforms.

Our analyses focus on changes in educational attainment across generations of the same family that reflect these recent policy developments, measured both in terms of absolute numbers of years and in terms of the completion of primary and secondary school. We examine both the change over generations and the determinants of that change, focusing on the relationships between the level of education in the older generations and the change in education across generations. We also examine the role of household socioeconomic status, including amount of land owned and possession of key durable goods. Additionally, we have detailed information about the principle expenses in the household, which will indicate resource constraints that may impact intergenerational educational trends. We will complement this analysis with exploratory analysis of responses in 2005 to questions on why school age children are not enrolled in school and opinions about primary and secondary school.

Descriptive Results

Univariate results focusing on the highest education achieved by any member of each generation show an expected pattern of increasing levels of education over time. The average highest years of education attained across families is 2.27 for the first generation, 6.12 for the second generation, and 4.66 for the third generation. The lower mean education of the third generation compared to the second generation may reflect that fact that some children in the sample are still of school age and may not have completed their schooling. Regression models at the level of the individual child in the third generation will limit the sample to children beyond the age of secondary school completion to eliminate this source of bias. Still, a large percentage of children (15%) have no education, even though they are of school age. Figures 1 and 2 show educational gains across generations in terms of the completion of primary and secondary school.

Bivariate results begin to tell the story of how educational status is and is not transmitted across generations. In the second generation, Figure 3 suggests that parents' education bears little relationship to own education. In Figure 4, however, the education of the second generation is clearly positively correlated with the education of their children. More children have a secondary education whose parents also have a secondary education. Regression models will explore this relationship in more detail, allowing us to see whether the apparent lack of a relationship between education of generation 1 and that of generation 2 is due to family constraints, possibly because the generation 1 respondents are largely settlers who gave up everything to come to the new frontier and claim land, or because of period effects. These models will allow us to examine the impact of calendar time, time on the frontier, and generation within our dataset (to assess possible sample selectivity bias) on the education of younger generations.

Planned Analysis

Using these data, we plan to conduct regression analyses predicting the education of the younger generation as a function of their parents' and grandparents' education and other key characteristics. We will first pool the individuals from generation 2 and generation 3 for an

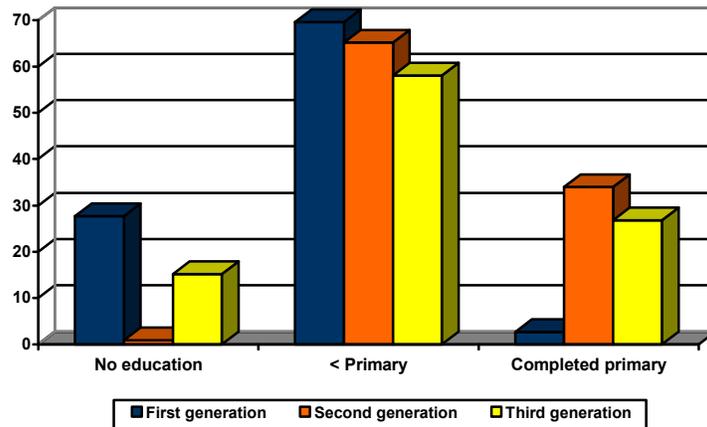
analysis using only parental education and characteristics on the right hand side, while controlling for year of birth. We will then focus only on individuals from generation 3 and analyze the relationships between both parental and grandparental education and third generation education. In conceptualizing education, we will explore the importance of education on the right hand side measured as completed years, as completed and started levels, and as deviation (direction only and then amount) from regional averages for their 5-year birth cohort (taken from census reports). We will also estimate both OLS models predicting completed years and multinomial logistic regression models of completed levels.

Our data collection in 2005 included a module on schools, giving us measures of the perceived quality of primary and secondary schools, and the distance to each, as well as more qualitative information on the problems with the schools and reasons for not sending children. We also have measures of key control variables, including income and expenditures, durable goods, land and business ownership, urban/rural residence and birthplace. As we move forward with models, we plan to explore the extent to which we have measures at the appropriate points in time (e.g., not only after children have left school) and to which we can control for or test sensitivity to various sources of endogeneity or sample selectivity in the modeling.

References:

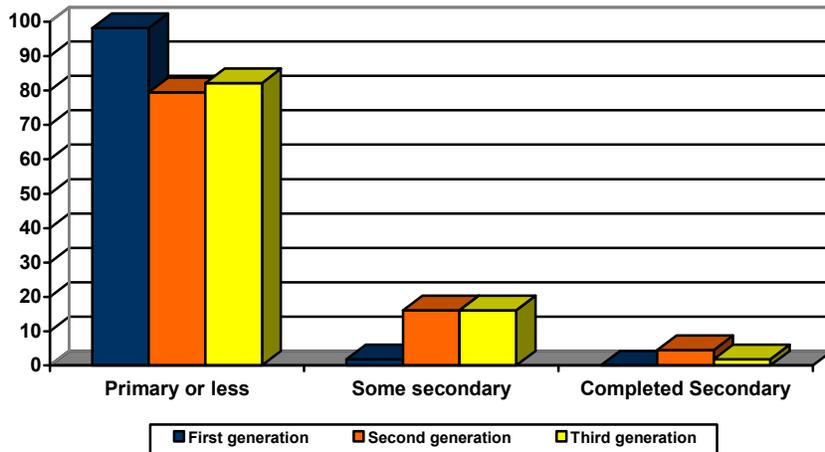
- Barros, Ricardo Paes de, Fransisco H. G. Ferreira, José R. Molinas Vega, and Jaime Saavedra Chanduvi. 2009. "Measuring Inequality of Opportunities in Latin America and the Caribbean." Latin American Development Forum, Washington, D.C. The World Bank.
- Barros, Ricardo Paes de, Rosane Silval Pinto de Mendonça, and James Alan Shope. 1993. "Regional Disparities in Education within Brazil: The Role of Quality of Education." Discussion text. Institute of Applied Economic Research (IPEA).
- Behrman, Jere R., Alejandro Gaviria, and Miguel Székely. 2001. "Intergenerational Mobility in Latin America." *Economia* 2(1):1-44.
- Behrman, Jere R. and Ryan Schneider. 1996. "Where Does Brazil Fit? Schooling Investments in an International Perspective." Pp. 49-82 in *Opportunity Foregone: Education in Brazil* ed. Nancy Birdsall and Richard H. Sabot. Baltimore: Johns Hopkins University Press.
- Blau, Peter and Otis Duncan. 1967. *The American Occupational Structure*. New York: The Free Press.
- Blom, Andreas, Lauritz Holm-Nielsen, and Dorte Verner. 2001. "Education, Earnings, and Inequality in Brazil, 1982–1998: Implications for Education Policy." *Peabody Journal of Education* 76(3/4):180-221.
- Breen, Richard and Jan O. Jonsson. 2005. "Inequality of Opportunity in Comparative Perspective: Recent Research on Educational Attainment and Social Mobility." *Annual Review of Sociology* 31:223-43.
- Buchmann, Claudia. 2000. "Family Structure, Parental Perceptions, and Child Labor in Kenya: What Factors Determine Who Is Enrolled in School?" *Social Forces* 78(4):1349-79.
- Buchmann, Claudia and Emily Hannum. 2001. "Education and Stratification in Developing Countries: A Review of Theories and Research." *Annual Review of Sociology* 27:77-102.
- Dahan, Momi and Alejandro Gaviria. 2001. "Sibling Correlations and Intergenerational Mobility in Latin America." *Economic Development and Cultural Change* 49(April):537-54.
- Gadotti, Moacir. 1992. "Brazil: Conflicts between Public and Private Schooling and the Brazilian Constitution." Pp. 111 – 130 in *Education, Policy, and Social Change: Experiences from Latin America*, ed. Daniel A. Morales-Gomez and Carlos Alberto Torres. Westport, CT: Praeger.
- Haddad, Sérgio. 1996. "Brazil." *International Review of Education – Internationale Zeitschrift für Erziehungswissenschaft – Revue Internationale de l'Education* 42(1):29-40.
- Janvry, Alain de and Elisabeth Sadoulet. 2005. "Conditional Cash Transfer Programs for Child Human Capital Development: Lessons Derived from Experience in Mexico and Brazil." Paper presented at the GRADE 25th anniversary conference in Lima, Peru.
- Lam, David. 1999. "Generating Extreme Inequality: Schooling, Earnings, and Intergenerational Transmission of Human Capital in South Africa and Brazil." Research Report. University of Michigan Institute for Social Research.
- Lillard, Lee A. and Robert J. Willis. 1994. "Intergenerational Educational Mobility: Effects of Family and State in Malaysia." *The Journal of Human Resources* 29(4):1126-66.
- Ministry of Social Development and Fight against Hunger. 2006. "Bolsa Familia Program Effects on Health and Education Services: Caching Unusual Suspects." National Secretary of Evaluation and Information Management.
- Moran, Emilio F., Eduardo S. Brondizio, and Leah K. VanWey. 2005. "Population and Environment in Amazonia: Landscape and Household Dynamics." Pp. 106-134 in *Population, Land Use, and Environment: Research Directions*, edited by B. Entwisle and P. Stern. Washington, DC: National Academies Press.
- Sewell, William H. and Hauser, Robert M. 1975. *Education, Occupation, and Earnings: Achievement in the Early Career*. New York: Academic Press.
- Soares, Fábio Veras, Rafael Perez Ribas, and Rafael Guerreiro Osório. 2010. "Evaluating the Impact of Brazil's Bolsa Familia: Cash Transfer Programs in Comparative Perspective." *Latin American Research Review* 45(2)173-90.
- Souza, Paul Renato. 2002. "Brazil: Special Session of the General Assembly on Children." Statement made on May 9, 2002. <http://www.un.org/ga/children/brazilE.ht-m>.
- United Nations. Accessed on 10-20-09. "Brazil – Education." <http://www.un.int/brazil/-brazil-education.htm>.
- VanWey, L. K., A. O. D'Antona, and E. S. Brondizio. 2007. "Household demographic change and land use/land cover change in the Brazilian Amazon." *Population and Environment* 28:163-185.
- World Bank. 2005. "Bolsa Familia: Changing the Lives of Millions in Brazil." <http://go.worldbank.org/M4EQDZNX0>.

Figure 1: Primary School Completion for First, Second, and Third Generations within Families



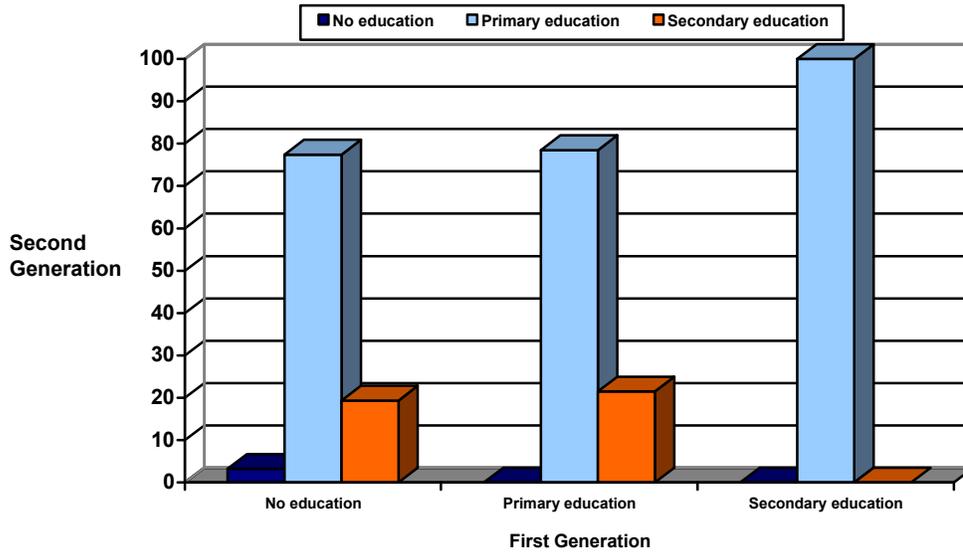
Note: N=112 households including first, second, and third generations. The “completed primary” category includes secondary and university education. The *y-axis* is the percentage having completed the given education level, e.g., about 3% of households have a first generation individual who has completed primary school. For all graphs presented, these education levels reflect the highest education attained across the individuals within each generation; there may be variation between individuals of the same generation within the same household.

Figure 2: Secondary School Completion for First, Second, and Third Generations within Families



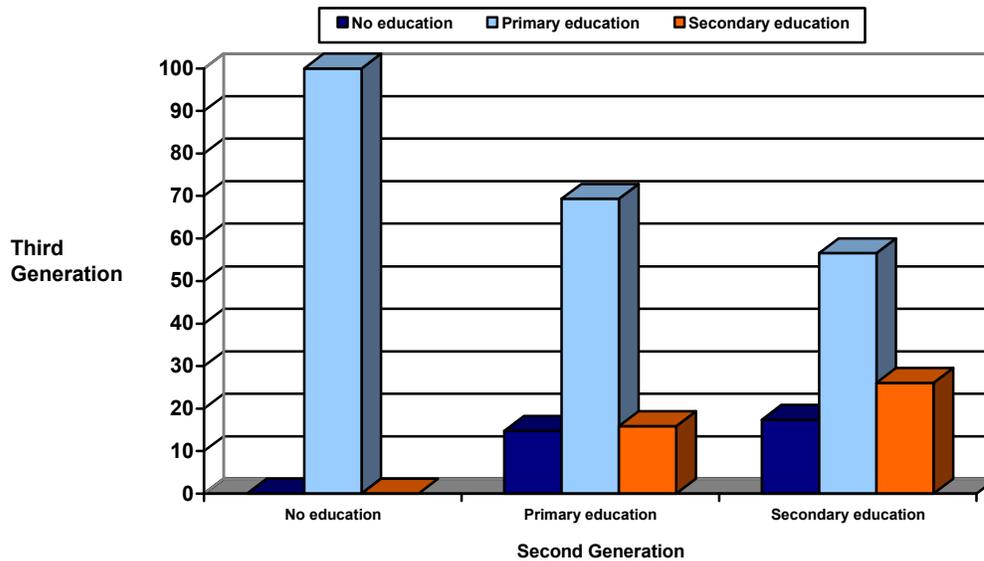
Note: N=112 households including first, second, and third generations. The “completed secondary” category includes university education. The *y-axis* is the percentage having completed the given education level, e.g., 0% of households have a first generation individual who has completed secondary school. For all graphs presented, these education levels reflect the highest education attained across the individuals within each generation; there may be variation between individuals of the same generation within the same household.

Figure 3: Conditional Probabilities: Second Generation's Education Given First Generation's Education



Note: N=112 households including first, second, and third generations. "Primary education" includes some primary education and completed primary school. "Secondary education" includes some secondary education and completed secondary school. The *y-axis* is the percentage of the second generation having completed the given education level (see key) conditional on their parents' education (first generation), e.g., about 22% of households with second generation individuals who have some secondary education have parents who have at most a primary education.

Figure 4: Conditional Probabilities: Third Generation's Education Given Second Generation's Education



Note: N=112 households including first, second, and third generations. "Primary education" includes some primary education and completed primary school. "Secondary education" includes some secondary education and completed secondary school. The *y-axis* is the percentage of the third generation having completed the given education level (see key) conditional on their parents' education (second generation), e.g., 26% of households with third generation individuals who have some secondary education have parents who also have some secondary education.