Kate H. Choi and Robert D. Mare
University of California – Los Angeles
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INTERNATIONAL MIGRATION OF MEXICANS AND THE REPRODUCTION OF EDUCATION FROM ONE GENERATION TO THE NEXT

Numerous studies have examined the effects of parents' migration on their children's educational attainment (Huntington 2004; Perlmann and Waldinger 1997; Wojtkiewicz and Donato 1995). In recent years, the educational mobility of Mexican Americans has garnered particular attention because of the persistent educational gap between Mexican Americans and other U.S.-Born groups. On average, second generation Mexican Americans attain much higher levels of education than their immigrant parents. Despite this increase, second generation Mexican Americans continue to attain lower levels of education than other U.S.-Born due to the extremely low levels of education of Mexican immigrants (Wojtkiewicz and Donato 1995). Moreover, beyond the second generation, there is a virtual absence of educational mobility. Because the educational mobility across generations is not large enough to overcome the extremely low levels of education of immigrants, Mexican Americans persistently have lower levels of education compared to other U.S.-Born.

On the basis of these trends, many observers fear that Mexican immigrants will never socioeconomically assimilate to mainstream U.S. society (Portes and Rumbaut 2001). Instead, Mexican Americans will become a permanent underclass made up of individuals who have low levels of education, are employed in low paying jobs, and rely heavily on state services (Camarota 2001). These conclusions are premature, however, because they are based on research using simple regression models of educational mobility between existing parent-child pairs while ignoring the impact of migration on a complex set of demographic processes that are interdependent with migration and intergenerational transmission of education. To accurately estimate the impact of Mexican migration on the distribution of schooling in the next generation, one should also account for the effects of migration on patterns of marriage, assortative mating, and fertility as well as the impact of these demographic changes on the transmission of educational advantage from one generation to the next.

The goal of this paper is to assess how Mexican migration to the U.S. affects the distribution of schooling for children growing up in the U.S, focusing on processes by which women's education and migration work through demographic mechanisms to affect children and the families in which they are raised. To do so, we will first employ recursive models to explore how women's education and migration influence several components of population growth as well as the process of intergenerational transmission of education. We will then examine how each demographic component influences the distribution of schooling in the next generation, directly, by influencing the transmission of education across generations, and indirectly, by shaping other components of population growth. Next, based on these findings, we will construct a demographic model that shows how Mexican migration to the U.S. influences the distribution of schooling in the next generation via changes in the size and makeup of the population. Lastly, we will use our demographic model to estimate the partial and combined effects of hypothetical changes in women's education, marriage, migration, fertility, and transmission of education on the distribution of schooling in the next generation in the U.S.

A demographic model is a promising way to study the effects of migration on intergenerational transmission of education because it also considers the impact of migration that accrues through changes in family formation and family size in addition to the effects of migration experiences and generational status on educational attainment. Not only will this method provide more accurate estimates of the aggregate effects of Mexican migration for receiving communities, but it will also isolate the specific demographic mechanisms that facilitate or impede educational mobility for Mexican Americans. This may help inform policies for facilitating the intergenerational educational mobility of Mexican Americans.

THEORETICAL AND EMPIRICAL CONSIDERATIONS

The proposed research focuses on five components of the relationship between Mexican migration and the reproduction of education: (1) marriage; (2) assortative mating, (3) migration, (4) fertility, and (5) intergenerational transmission of education. Prior studies provide some basis for studying each of these components separately. The main goal of this research is to examine how they fit together. Below is a brief summary of previous findings.

Effects of Mexican Migration on Marriage and Assortative Mating

Whether, when, and whom a woman marries affect how many children she has and how well those children do in school. Mexican migration to the U.S. shapes the process of

educational reproduction by introducing a surplus of men with lower levels of education to the local marriage market (Choi and Mare 2008). The surplus of men creates a more favorable marriage market for women with lower levels of education, increasing the likelihood that they marry (Choi and Mare 2008). At the family level, higher rates of marriage increases the resources available to the children of lesser educated women by raising the chances that they grow up in two parent instead of single parent families. At the population level, higher rates of marriage among individuals with lower levels of education increases the presence of children raised by parents with low levels of education.

Differential Fertility

The tendency for women with different amounts of education to have different numbers of children also affects the distribution of educational attainment in the next generation. Mexican American women have higher levels of fertility than non-Hispanic Whites and Blacks (Bean and Swicegood 1985; Frank and Heuveline 2005). At the family level, Mexican American children will have fewer resources available to them because they must share family resources with greater numbers of siblings. At the population level, the proportion of children raised by lesser educated mothers will increase within the U.S. population due to Mexican migration and the high fertility rates among Mexican women.

Mexican Migration and Intergenerational Transmission

The distribution of schooling in the next generation is determined by the distribution of schooling in the parent's generation and the degree of educational mobility between generations. Foreign-born Mexicans have substantially lower levels of education compared to other individuals in their age group living in the U.S. Whereas adults living in the U.S. averaged 13.6 years of education in 2000, foreign born Mexicans in the same age group averaged less than 8.8 years of education (Duncan and Trejo 2007). Second generation Mexican Americans enjoy substantial upward educational mobility compared to their parents, averaging 12.2 years of education (Duncan and Trejo 2007). Nonetheless, the educational mobility is not large enough to compensate for Mexican immigrant's low levels of education. Furthermore, beyond the second generation, there is also a virtual absence of educational mobility (Duncan and Trejo 2007).

MODEL FOR INTERGENERATIONAL EFFECTS OF MIGRATION & EDUCATION

Our approach to studying intergenerational effects extends previous work by Mare and Maralani (2006), which examines how demographic mechanisms contribute to the

intergenerational effect of women's education on their offspring's education. The proposed research adds migration to the basic demographic model of reproduction of education to gain insight on the long-term consequences of migration on the socioeconomic conditions of receiving communities in addition to the process by which education is reproduced from one generation to the next.

To develop this demographic model, we first document how women's marriage, their husbands' education and migration status, fertility, and children's educational attainment each vary with the educational attainment levels of women. Second, we document how women's education, marriage, and patterns of marital sorting influence their migration experiences, and in turn, how women's migration influences fertility rates and intergenerational transmission of education. These relationships are to be estimated using statistical models for each outcome: whether a woman marries, the educational and migration characteristics of the man she marries, the likelihood that she will migrate, how many children she bears, and the educational attainment of each of her children.

In initial, simplified versions of the model, we assume that (1) women's education is the only truly exogenous independent variable; (2) a woman's schooling affects whether and whom she marries (i.e. husband's educational attainment and international migration status); (3) a woman's schooling and her husband's characteristics affects whether she migrates to the U.S. (Cerrutti and Massey 2001); (4) a woman's schooling, her marital status, her husband's characteristics, and her migration behavior affect her fertility; and (5) mother's and father's schooling and migration statuses and number of siblings affect each child's educational attainment.

The combined model can be written formally as:

$$r_{jfmgk \mid i} = p^{H}_{kg \mid i} \, p^{M}_{m \mid gki} \, r^{F}_{f \mid gkim} \, p^{J}_{j \mid fmgki}$$ …………………………………….. *Equation 1*

where $r_{jfmgk \mid i}$ is the number of children with education *j* whose mother has migration experience *m*, fertility level *f*, and education level *i*, and is married to a man with migration status g and education level *k*:; $p^{H}_{kg \mid i}$ denotes the probability that a woman with education *i* marries a man with level of education *k* and migration status *g*; $p^{M}_{m \mid gki}$ denotes the probability that a woman with levels of education *i* and husband with education *k* and migration status *g* migrates from Mexico

to the U.S.; $r^{F}_{f|gkim}$ denotes the number of children born to a woman who has migration experience *m*, education level *i,* and a husband with education level *k* and migration experience *g;* and $p^{J}_{j|fmgki}$ denotes the probability that a child whose mother has education level *i,* migration experience *m,* husband with education level *k* and migration status *g, and* fertility level *f* achieves educational attainment *j* . Each component of the model is a "dependent variable" in a logistic or poisson regression model (depending on whether it is a probability or a rate) for the effects of the preceding variables in the model. The combined rates can be used to project the education distribution of successive generations under alternative simulations (Mare 1997; Mare and Maralani 2006).

Although this model incorporates many facets of the link between women's schooling, migration, and the educational attainment of children, it also makes simplifying assumptions. It ignores divorce and separation; it assumes a simple one way direction of causality between marriage, migration, and fertility; it focuses on the behavior of women while treating men's characteristics as aspects of women's marriage choices; it ignores the timing of events within women's and children's lives; and it assumes that the separate processes are conditionally independent given the variables included in the model. As the research progresses, some effort will be made to relax these assumptions and to explore the robustness of conclusions to alternative assumptions.

DATA

Our demographic model will use multiple sources of data to compute rates of migration, marriage, fertility, and patterns of intergenerational transmission of education, which individually describe a facet in the link between women's education, migration, and children's education. The computed rates will be later combined to estimate and simulate the distribution of schooling in the next generation. Specifically, we will use three datasets: Mexican Family Life Survey (MxFLS), National Longitudinal Survey of Youth 1979 (NLSY79), and the 1980 U.S. Census. Table 1 describes how each data source contributes to the construction of our demographic model.

Table 1 goes here.

The MxFLS is a longitudinal, nationally representative survey of 35,000 individuals who form part of 8,400 households in Mexico. It collected detailed information on the socio-demographic characteristics and retrospective histories of marriage and migration for all adult

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household members and fertility history for all adult female household members. It includes information on 400 return migrants who lived in the U.S.

The NLSY79 is a nationally representative survey of 12,686 American youth aged 14 to 22 in 1979. The NLSY79 includes information about the social and demographic characteristics of the sampled individual as well as the respondent's parents including their place of birth, levels of education, age, and histories detailing the periods when the respondent was separated from their parents before their 19th birthday. For the proposed analysis, the NLSY79 youths serve as the children in the next generation. This dataset includes 687 respondents who self-identify as Mexican. Of these, 264 are foreign-born and 423 are second generation Mexicans.

The MxFLS and NLSY79 are well-suited for the present analyses because they include detailed information on the socio-demographic characteristics of the respondents as well as their parents. The detailed information in both datasets allow a more accurate description of the association between parents' and child's schooling as well as the demographic mechanisms that contribute to educational reproduction, including marriage and fertility. These data also provide large enough samples of Mexicans to permit a study about their educational reproduction.

The 1980 U.S. Census will be used to compute the education-specific proportion of childlessness among women who are part of the same birth cohorts as the mothers of the NLSY 79 youths[1]. This census includes information about the respondent's country of birth, respondent's ancestry, and the number of child born to each respondent. Together the 1980 Census and NLSY79 provide information on all women in the parent's generation in the U.S.

ESTIMATIONS AND SIMULATIONS

We will estimate statistical models for migration, marriage, assortative mating, fertility, and offspring's educational attainment with maximum likelihood estimates. Each component will be estimated separately. We use estimated parameters in combination with actual and hypothetical distributions of women's education, marriage, assortative mating patterns, migration, fertility, and educational mobility to compute predicted probabilities and rates for each component of Equation 1. We then combine each component to estimate the distribution of schooling in the next generation. Table 2 lists some of the hypothetical scenarios used in our

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[1] We are interested in the intergenerational transmission of education from one generation to another. NLSY79 provides us with a sample of existing mother-child pairs. We need to supplement the NLSY 79 with the 1980 U.S. Census so that we can include childless women to ensure that we have a representative sample of all women in the parent's generation.

simulations. Some of these scenarios consider the partial effects of changes to one of the components of our demographic model while other scenarios consider the combined effects of changes to multiple components in our demographic model on the distribution of schooling in the next generation. We briefly describe the expected results for two hypothetical scenarios.

Table 2 goes here.

Scenario 4 explores the partial effect of changes in the educational composition of Mexican migrants on the distribution of schooling in the next generation. We plan to simulate this scenario by decreasing the migration rates for Mexican women with fewer than 9 years of education, holding constant rates of marriage, fertility, and migration for those with higher levels of education as well as the pace of intergenerational transmission of education. If Mexican migrants with lower levels of education were to migrate less, then the number of Mexican American children raised by lesser educated women will decrease due to fertility differentials by education. Lower fertility in conjunction with the more favorable educational distribution in the parent's generation will result in a population of children with higher levels of education even if the education-specific rates of educational mobility were to stay the same.

Scenario 6 explores the partial effect of decreases in fertility for all Mexican women regardless of education. We plan to simulate this scenario by decreasing fertility rates for women who report having migrated from Mexico, holding constant marriage rates, migration rates, the distribution of schooling among Mexican women, and intergenerational transmission of education. The majority of Mexican women have fewer than 9 years of education. Therefore, a decrease in the fertility among Mexican women will have the largest effects on the number of children born to and raised by women with less than 9 years of education. The decrease of children born to and raised by women with less than 9 years of education will result in a population of children with higher levels of education.

These simulations will isolate the effects of various demographic mechanisms, including women's migration, marriage, and fertility and examine how these processes accentuate or dampen the effects of changes in migration rates and improvements in women's education.

PLAN AND FUTURE STEPS

The current paper is in its preliminary stages. We intend to construct our demographic model and run our simulations by February 2009. We are confident that we will have a well-developed full draft of this paper by March 3, 2009.

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Table 1. Description of data sources for the different components of the demographic model on the effects of migration on the distribution of schooling in the next generation.

		MxFLS	1980 U.S. Census	NLSY 79
Country	:	Mexico	U.S.	U.S.
Subject of analysis	:	Women in same birth cohort as mothers of NLSY 79 Youths	Women in same birth cohort as mothers of NLSY 79 Youths	Mothers (Mothers of NLSY 79 Youths) Children (NLSY 79 Youths)
Provides information on	:	Marriage rates*	Fertility* *Proportion childless*	Fertility* *Number of children for mothers of NLSY 79 youths*
		Patterns of marital sorting* *Husband's level of education* *Husband's migration experiences*		Transmission of Education *Mother's education* *Children's education*
		Migration rates*		

* Rates are computed separately by education

Table 2. Possible scenarios for simulations exploring the impact of migration on the reproduction of education

Scenario	Women's Education	Marriage	Migration	Fertility	Intergenerational Transmission
1	Hypothetical increases in women's education in Mexico	Actual	Actual	Actual	Actual
2	Actual	Hypothetical Change in Marital Sorting - Women enter into hypogamous unions	Actual	Actual	Actual
3	Actual	Hypothetical Change in Marital Sorting - Women enter into hypergamous unions	Actual	Actual	Actual
4	Actual	Actual	Hypothetical changes in the educational composition of migrants - Decrease in % of migrants with less than 9 years of education	Actual	Actual
5	Actual	Actual	Hypothetical changes in the educational composition of migrants - Increase in % migrants with less than 9 years of education	Actual	Actual
6	Actual	Actual	Actual	Hypothetical decrease in the fertility of Mexican women	Actual
7	Actual	Actual	Actual	Actual	Decreases in the pace of upward educational mobility
8	Actual	Actual	Actual	Hypothetical decrease in the fertility of Mexican	Increases in the pace of upward educational mobility