Demographic Aspects of Intergenerational Transmission: Women's Schooling and the Schooling of the Next Generation

(Abstract)

Vida Maralani and Robert D. Mare
University of California – Los Angeles

September 2004

Analysts of social stratification routinely estimate the "intergenerational effects" of parents' socioeconomic characteristics. Typically these estimates are based on regressions of offsprings' characteristics on one or more parental characteristics, using sample survey data for cohorts of offspring. Whereas these investigations aptly describe the associations between parents' and offsprings' socioeconomic characteristics, they often fail to specify the mechanisms through which parents' characteristics may *cause* the socioeconomic attainment of their children.

Consider the effect of mother's educational attainment on the educational attainment of her daughter or son. If mother's attainment is a cause of her child's attainment, then one may ask: what is the effect on children of a hypothetical policy of raising or lowering the schooling of an individual woman, of an entire cohort of women, or some targeted subgroup of women? This question raises important issues of research design and model specification. The regression estimates based on samples of offspring can at best show the impact of changing a woman's attainment level *conditional* upon her giving birth to the sampled child and, if father's characteristics are controlled, upon her union with the child's father. But this kind of conditional estimate may be unsatisfactory for many purposes. Women complete almost all of their schooling prior to childbearing and, in most societies, prior to meeting the fathers of their children. A change in a woman's educational attainment may, for example, alter the number and timing of children that she bears, as well as whether, when, and whom she marries. Thus, the estimate of the impact of mother's education depends on whether it is assumed that she has given birth already, has not given birth but has formed a union with a child's (potential) father, or has not yet taken a partner.

At the individual level, fertility, marriage and mortality intervene between a woman's educational attainment and the attainment of her children. But it is impossible to discern the full

impact of changing a woman's educational attainment by conditioning on the observation of her sampled child. Rather, the intergenerational impact of a woman's education on her offspring's education is weighted by the number and timing of her children, her marital status, the characteristics of her spouse or partner, and women's and children's survival probabilities. In the population, the impact of a change in the average level or the distribution of women's schooling must take full account of both the intergenerational correlation of educational attainments and the population renewal process.

In an earlier paper (Mare and Maralani 2004), we developed these arguments formally and presented models that are better suited for the analysis of the effects of mother's educational attainment on her children's attainment. These models extended earlier work by Mare (1997) that shows the joint effects of differential fertility and intergenerational transmission on the education distributions of successive generations. We applied these models to data on Indonesia and showed how traditional estimates of the effects of mother's educational attainment change when one accounts for how her education affects her marriage prospects and her fertility. In studying Indonesia, we focused on a society in a middle level of economic development that had, until recently, relatively low levels of educational attainment, a considerable gender gap in schooling, relatively high fertility, and nearly universal marriage. We examined the consequences of increasing the educational attainment of women who would otherwise have little or no schooling, and emphasized how such an intervention could have complex implications if it affected the kinds of husbands that women marry as well as their level of fertility.

In the proposed paper we extend this past work. First, we extend our models to examine the effects of increases in women's educational attainments on the *timing* of marriage and fertility. Changes in women's schooling are likely to change the timing of first marriage and first birth as well as the timing of subsequent births (and therefore mother's age at each child's birth). We aim to capture both individual and aggregate level effects of possible changes in marriage and fertility timing. For example, on the one hand, if an increase in women's educational attainment raises the age at which she bears children, her children may benefit from the greater maturity and economic stability that older parents provide (Mare and Tzeng 1989). On the other hand, if a higher level of education reduces women's effective reproductive age span, fewer children may be born who can benefit from the superior environments that older and

better educated women provide. Allowing for differentials in the timing of marriage and fertility by levels of women's schooling allows us to build demographically sophisticated models that can be applied to many different contexts and demographic regimes.

Second, we add information on family structure (such as sibship size effects and time spent in female headed household) to our models. The decrease in completed fertility that may result from increasing a woman's schooling will carry through to the sibship size that her children experience while growing up. Our models make family size and family structure endogenous to changes in women's schooling. Third, we include differential child mortality and survival probabilities based on differences in mothers' and women's schooling. Improvements in child and maternal mortality are often cited as beneficial outcomes associated with improvements in women's schooling yet these are rarely included in the analysis of the intergenerational effects of changes in women's schooling. Our models allow changes in women's schooling to change the survival probabilities of children in the next generation. Thus, increasing women's schooling may result in increasing the survival of children (who are likely to have more schooling themselves) as well as increasing the proportion of women who survive through their child bearing years.

Fourth, we model cohort change in these demographic processes to capture the possibility that the "effect" of changing women's schooling may itself change considerably over time and context. This component is especially important in a county such as Indonesia, which has undergone massive and rapid demographic change in recent decades. This approach allows us to investigate whether different demographic contexts produce different effects of changes to women's schooling. Our analysis includes three cohorts of Indonesian women, and our models and simulations examine whether changes in women's schooling have different effects for each of these cohorts.

In addition to allowing for a more demographically sophisticated analysis, these extensions to our model also make our approach more directly applicable to more developed contexts such as the United States and Europe. In these contexts, differences in timing, family structure, nonmarital fertility, and cohort change are also key features of the intergenerational transmission and population renewal processes. These mechanisms, however, may work quite differently in more developed countries than they do in a developing one such as Indonesia. Our

expanded models allow us to capture these differences by women's schooling in a variety of different demographic and socioeconomic contexts.

The analysis uses two rich sources of data on Indonesia. First, we use the 1993, 1997, and 2003 waves of the Indonesian Family Life Survey (IFLS), a comprehensive socioeconomic and health survey, containing detailed information on demographic and socioeconomic characteristics, household economy, health, fertility and marriage histories, and child cognitive and health assessments. In addition, we use the 1987 Indonesia Demographic and Health Survey (called the "National Indonesia Contraceptive Prevalence Survey (NICPS)) for information on infant and child mortality. Our analysis includes a complex demographic model as well as a series of simulations that assess the effect of hypothetical changes to women's schooling in one generation on the predicted educational distributional of children in the next generation.

References

Mare, Robert D. 1997. "Differential Fertility, Intergenerational Educational Mobility, and Racial Inequality." *Social Science Research* 26: 263-91.

Mare, Robert D. 2001. "Observations of the Study of Social Mobility and Inequality." Pp. 477-88 in D. B. Grusky (ed.) *Social Stratification: Class, Race, and Gender in Sociological Perspective* (Second Edition). Boulder, CO: Westview Press.

Mare, Robert D., and Vida Maralani. 2004. **"**How Do Mothers' Educational Attainments Affect the Educational Attainment of the Next Generation?" California Center for Population Research Working Paper, CCPR-011-04, **http://www.ccpr.ucla.edu/ccprwpseries/ccpr_011_04.pdf**

Mare, Robert D., and Meei-Shenn Tzeng. 1989. "Fathers' Ages and the Social Stratification of Sons." *American Journal of Sociology*: 108-131.