



# Educational mobility across three generations of American women



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## ABSTRACT

We analyze the intergenerational transmission of education in a three-generation sample of women from the 20th century US. We find strong three-generation educational persistence, with the association between the education of grandmothers and their granddaughters approximately two times stronger than would be expected under the type of first-order autoregressive transmission structure that has been assumed in much of the existing two-generation mobility literature. These findings are robust to using alternative empirical specifications and sample constructions, and are successfully replicated in a second independently drawn data set. Analyses that include males in the youngest and oldest generations produce very similar estimates. A variety of potential mechanisms linking the educational outcomes of grandparents and grandchildren are discussed and where possible tested empirically.

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## Introduction

Social scientists have a longstanding interest in the extent to which social and economic well-being is transmitted across generations, and a large literature studies the degree of intergenerational mobility across two consecutive generations (see Solon, 1999, and Black & Devereux, 2010, for reviews). However, an emerging literature, which is reviewed in detail below, examines the transmission of earnings, educational attainment, and other characteristics across three or more generations. While extending the study of intergenerational mobility beyond two generations has the potential to substantially enrich our understanding of long-run social mobility, the increased data requirements of such studies have limited the number of contexts for which reliable multigenerational estimates are available.

The main contribution of the present study is to assemble a nationally representative sample of approximately 2,000 American women born in the early 1980s with linked information on the educational outcomes of their mothers and grandmothers, then use this data to estimate the level of educational persistence across three generations in 20th century United States. Only a small number of studies have evaluated multigenerational mobility levels in contemporary Western economies, and most existing work has either focused on European countries with greater data availability, or on occupational class measures rather than education. The present study is also among the first to focus explicitly on the multigenerational mobility levels of women.

The paper's main finding is that there was a high degree of multigenerational educational persistence in the studied context. In particular, our estimates of three-generation educational associations are approximately twice as strong as those predicted by assuming that transmission follows a simple first-order autoregressive – or AR(1) – structure and then multiplicatively extrapolating two-generation transmission estimates. To demonstrate the

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reliability of our findings, we successfully replicate the baseline results in a second, independently drawn national sample, and present robustness checks that suggest our results are likely not due to the mismeasurement of education and are not sensitive to using alternative empirical specifications or sample constructions. While the structure of our data leads us to focus primarily on transmission within all-female lineages, we are also able to estimate multigenerational transmission strength in limited samples that also include men, and results using these samples are very similar to our baseline findings for women.

The remainder of the paper proceeds in six sections. [Section 1](#) briefly reviews relevant previous research; [Section 2](#) describes the utilized data; [Section 3](#) presents our baseline findings; [Section 4](#) conducts a number of robustness checks and auxiliary analyses; [Section 5](#) discusses and tests various mechanisms that may help to explain our findings; [Section 6](#) concludes.

## 1. The current state of the literature

The literature studying socioeconomic mobility across three or more generations is much less developed than the literature on two-generation mobility, owing primarily to data constraints, but several existing studies do analyze multigenerational mobility. Such estimates first appeared in the literature several decades ago, and a number of more recent studies have also estimated transmission for various socioeconomic characteristics and in a variety of historic and geographic contexts.

With respect to early multigenerational studies, ([Hodge, 1966](#)) used data on the occupations of American men to estimate three-generation transition probabilities, and found that while occupational transition probabilities differed from those predicted by a simple Markov model, the associations in the occupations of grandfathers and grandsons were not quantitatively large after accounting for the occupations of fathers. This led Hodge to conclude that multigenerational models with a “memory” of only one generation were generally adequate, since “grandfather’s occupation does not have any appreciable direct effect upon a person’s occupation beyond the indirect effect induced by its influence upon father’s occupation” (p. 25).

Other relatively early multigenerational estimates included [Behrman & Taubman \(1989\)](#), ([Peters, 1992](#)) and ([Warren & Hauser, 1997](#)), with all of these studies generally failing to find large three-generation effects. Specifically, [Behrman & Taubman \(1989\)](#) used data from the National Research Council Twin Sample and found that in OLS estimation the effect of grandparent’s schooling on grandchild’s schooling – conditional on parent’s schooling – is positive but small in magnitude and statistically insignificant. Similarly, ([Warren & Hauser, 1997](#)) used data from the Wisconsin Longitudinal Survey and regressed the occupational status of children on the education and occupational statuses of both parents and all four grandparents, finding grandparent effects that were generally positive but typically not statistically significant. Finally, ([Peters, 1992](#)) focused primarily on two-generation income and earnings transmission in the US, but also presented results that regressed child income or earnings on the income or

earnings of their parents and the educational attainment of their grandparents, finding no significant conditional effect of grandparent’s education on child income or earnings.

A more recent set of papers has reexamined the issue of multigenerational mobility, and in contrast to early studies has typically found strong three-generation transmission. For instance ([Chan & Boliver, 2013](#)) found strong three-generation persistence in occupational prestige in Britain; ([Lindahl, Palme, Sandgren Massih, & Sjögren, 2015](#)) (forthcoming) used exceptional Swedish data to document significant three-generation effects for income and four-generation effects for education; ([Johnston, Schurer, & Shields, 2013](#)) found strong three-generation persistence in mental health outcomes in the US; ([Zeng & Xie, 2014](#)) documented a strong association between the education of Chinese grandparents and their co-residing grandchildren (but not among non-co-residing children); and ([Hertel & Groh-Samberg, 2014](#)) found low levels of occupational class mobility across three generations in both Germany and the US. Additionally, widely discussed work by [Clark \(2014\)](#) used rare surnames to estimate multigenerational mobility levels across multiple centuries and in various countries and reported very high persistence levels, though the reliability of Clark’s conclusions has been questioned (see the discussion in [Solon, 2014](#)).<sup>1</sup>

A smaller number of recent papers fail to find significant associations across three generations. These include ([Lucas & Kerr, 2013](#)), who reported three-generation income and earnings mobility estimates in a 20th century Finnish sample; ([Erola & Moio, 2007](#)), who also used Finnish data and find small conditional effects of grandparent’s social class; and ([Jæger, 2012](#)), who used data from the Wisconsin Longitudinal Survey and found that various socioeconomic characteristics of grandparents (as well as other extended family members) typically do not have strong associations with children’s educational outcomes.

There are a number of possible explanations for the divergence in findings across these previous studies. Early studies that did not find large multigenerational effects, such as [Behrman & Taubman \(1989\)](#) and ([Warren & Hauser, 1997](#)), often estimated separate coefficients for each parent and each available grandparent (up to six separate coefficients), and since these variables are highly collinear the estimates may become statistically insignificant, especially in the relatively small available samples.<sup>2</sup> The methodological approaches of the cited papers also vary significantly, which could partially account for the disparate findings. Perhaps most importantly though, true multigenerational mobility levels may simply not be

<sup>1</sup> Several current working papers also find three-generation associations in excess of those implied by AR(1) transmission, including ([Long & Ferrie, 2012](#); [Olivetti, Paserman, & Salisbury, 2013](#); [Sauder, 2006](#)) and ([Braun & Stuhler, 2015](#)).

<sup>2</sup> [Braun and Stuhler \(2015\)](#) also find that in most instances the association between the educational attainment of grandparents and grandchildren is substantially reduced when they condition on the educational attainment of both parents in the intermediate generation. The authors interpret this as suggesting that unconditional grandparent-grandchild associations partially reflect bias from the omission of relevant parental characteristics. We discuss how conditioning on both mother and father education impacts our own three-generation estimates in [Section 5](#) below.

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