California Center for Population Research
University of California - Los Angeles

Trends in Educational Assortative Marriage From 1940 to 2003

Christine R. Schwartz
Robert D. Mare

CCPR-017-05

July 2005

California Center for Population Research
On-Line Working Paper Series

TRENDS IN EDUCATIONAL ASSORTATIVE MARRIAGE FROM 1940 TO 2003*

Christine R. Schwartz and Robert D. Mare

University of California – Los Angeles

July 6, 2005

*Christine R. Schwartz and Robert D. Mare, Department of Sociology, University of California – Los Angeles. Address correspondence to Christine R. Schwartz, Department of Sociology, UCLA, 264 Haines Hall, Box 951551, Los Angeles, CA 90095-1551; E-mail: schwar@ucla.edu.
The first author gratefully acknowledges financial support from the Jacob K. Javits Fellowship Program and the UCLA Department of Sociology. The second author received support from the John D. and Catherine T. MacArthur Foundation and the Russell Sage Foundation. This research was carried out using the facilities of the California Center for Population Research, which is supported by the National Institute of Child Health and Human Development. A previous version of this paper was presented at the 2004 meetings of the Population Association of America in Boston. The authors thank Elizabeth Bruch, Megan Sweeney, the members of the UCLA Sociology of the Family Working Group, and three anonymous reviewers for their helpful comments.

ABSTRACT

This paper reports trends in educational assortative marriage from 1940 to 2003 in the United States. Analyses of Census and Current Population Survey data show that educational homogamy decreased from 1940 to 1960 but increased from 1960 to 2003. From 1960 to the early-1970s, increases in educational homogamy were generated by decreasing intermarriage among groups of relatively well educated persons. College graduates, in particular, were increasingly likely to marry each other rather than those with less education. Beginning in the early-1970s, however, continued increases in the odds of educational homogamy were generated by decreases in intermarriage at both ends the education distribution. Most striking is the decline in odds that those with very low levels of education marry up. Intermarriage between college graduates and those with "some college" continued to decline but at a more gradual pace. As intermarriage declined at the extremes of the education distribution, intermarriage among those in the middle portion of the distribution increased. These trends, which are similar for a broad cross-section of married couples and for newlyweds, are consistent with the growing economic and cultural divide between those with very low levels of education and those with more education in the U.S.

INTRODUCTION

Patterns of who marries whom have implications for the formation of families, the maintenance of boundaries between groups, the extent of inequality among families and individuals, and the intergenerational transmission of social and genetic traits (e.g., Cavalli-Sforza and Feldman 1981; Epstein and Guttman 1984; Fernández and Rogerson 2001; Johnson 1980; Kalmijn 1991a, 1991b; Mare 1991, 2000). Educational assortative marriage has received particular attention from scholars because of the role that education plays in economic inequality and its persistence from generation to generation (e.g., Blossfeld and Timm 2003; Kalmijn 1991a, 1991b; Mare 1991; Qian 1998; Qian and Preston 1993; Raymo and Xie 2000; Smits, Ultee, and Lammers 1998, 2000; Ultee and Luijkx 1990). Past research has shown strong evidence of increases in the educational resemblance of spouses since at least the 1960s (Kalmijn 1991a, 199b; Mare 1991; Pencavel 1998; Qian and Preston 1993; Smits, Ultee, and Lammers 2000), giving rise to a concern that marriage patterns may contribute to growing economic and educational inequality (e.g., Fernández and Rogerson 2001; Kremer 1997; Mare 2000). Regardless of whether increases in the educational resemblance of spouses increase inequality in future generations, changes in assortative marriage patterns are indicators of changes in the rigidity of social boundaries and are important components of changes in the makeup of families and households.

Despite the potential significance of changes in assortative marriage, research on trends since the early-1990s is limited (Rose 2004). It is instructive to examine these recent trends in view of many changes in young people's lives that may affect patterns of intermarriage. For example, average age at first marriage continued to rise for both men and women through the 1990s (Casper and Bianchi 2002), as has the likelihood of non-marital cohabitation (Bumpass

and Lu 2000). Educational attainment has continued to increase as well, albeit at a more rapid pace for women than for men (U.S. Census Bureau 2004). Furthermore, the rapid growth in economic inequality by education that characterized the 1980s continued through the 1990s (Gottschalk 1997; Mishel, Bernstein, and Boushey 2005:152). Continued changes in union formation processes, in men's and women's schooling, and increases in economic inequality, among other trends, may have had important influences on patterns of assortative marriage over the past decade.

This paper describes trends in the educational resemblance of spouses in the U.S. between 1940 and 2003. We go beyond prior studies by extending the time series through 2003 and by providing a more detailed description of earlier trends than has been given previously. We use Census data from 1940 to 2000 and Current Population Survey (CPS) data from 1962 to 2003. This time series allows us to pinpoint the timing of changes in assortative marriage patterns more accurately than past studies. We examine whether increases in educational *homogamy*, that is, the tendency for husbands and wives to share the same educational characteristics, have continued over the past ten years and, to the extent that changes have occurred, we investigate how they vary across the education distribution.

PREVAILING MARRIAGES VS. NEWLYWEDS

Past studies have often focused on assortative marriage trends among recently contracted marriages, or *newlyweds,* to avoid bias from selective marital dissolution, educational upgrading after marriage, and remarriage (e.g., Kalmijn 1994; Mare 1991; Qian 1998; Qian and Preston 1993; Raymo and Xie 2000). In this paper, we focus mainly on trends in *prevailing marriages*

and supplement our analysis with trends in the resemblance of newlyweds. We focus on prevailing marriages rather than newlyweds in part because neither age at marriage nor date at marriage information, which would allow us to identify recently wedded couples, are available in the Census or CPS beyond 1980 and 1995, respectively, making it impossible to describe assortative marriage trends for newlyweds during the most recent period. In addition, although newlyweds are an appropriate unit of analysis for identifying the effects of historical changes on who marries whom (Raymo and Xie 2000), trends among couples in prevailing marriages may have more direct implications for social openness and inequality.

Focusing on the resemblance of newlyweds avoids biases due to selective marital dissolution, educational upgrading after marriage, and remarriage but these factors may play an important role in determining the overall social distance between spouses. For example, if divorce is prevalent and is more likely to occur among educationally dissimilar couples, then the similarity of spouses may be reinforced by high divorce rates and our conclusions about the social distance between groups measured at the time of marriage would need to be reexamined (Kalmijn 1998:397). Furthermore, prevailing marriages represent all married-couple families at a given time and thus are an appropriate unit of analysis when one's concern is the impact of assortative marriage on increases in inequality across families. Finally, examining prevailing marriages brings us closer to the environments in which children are raised and thus the context in which the intergenerational transmission of status occurs than do studies of newlyweds. Assortative marriage shapes the characteristics of families, and to the extent that parents pass on their educational characteristics to their children, the distribution of education and inequality in the next generation.

Despite our focus on prevailing marriages, we supplement our analyses with an examination of trends for newlyweds. We show that, over periods in which it is possible to examine educational assortative marriage for both prevailing and new marriages, their trends are similar, although trends for prevailing marriages tend to "lag" those for newlyweds. The extent to which trends in spousal resemblance among couples in prevailing marriages lag trends for newlyweds depends on the width of the age range examined and on marital duration. Analyses of trends among wide age ranges produce longer lags whereas focusing on younger couples produces shorter lags. Because of the potential link between assortative marriage and inequality in the next generation, we examine an age range that covers most married couples with co-resident children, but is narrow enough to ensure that long-term trends in the two samples are similar.

CHANGES IN EDUCATIONAL ASSORTATIVE MARRIAGE

Past studies of assortative marriage show that the educational similarity of spouses has increased in the U.S. from at least the early-1960s through the late-1980s (Kalmijn 1991a; Mare 1991; Pencavel 1998). College graduates, in particular, have become increasingly likely to marry one another rather than marry down (Blackwell 1998:174; Kalmijn 1991a; Mare 1991). For example, Mare (1991, Table 4) finds that the odds of intermarriage between college graduates and high school graduates declined by 25% between 1940 and the late-1980s. Although the odds of intermarriage between education groups clearly fell between 1940 and 1970, the odds of intermarriage appear to stabilize or even increase between 1970 and the late-1980s (Mare 1991:24; Raymo and Xie 2000). In this paper, we investigate whether these changes foreshadow

the beginning of a longer-term stabilization or represent a temporary detour from continued increases in spousal resemblance.

Previous researchers have emphasized three explanations for increases in the resemblance of spouses, which generally point to continued increases through the 1990s. One explanation pertains to the structuring effects of educational institutions as marriage markets and the expansion of education over time. At any given average age at marriage, as average educational attainment increases, young people may be more likely to meet their partners in school and thus marry homogamously (Mare 1991). As the gap between school completion and marriage grows, however, young people may be more likely to meet partners in educationally heterogeneous contexts, such as workplaces, thereby reducing their odds of homogamy. From 1940 to 1970, the gap between age at school completion and age at marriage declined as average educational attainment increased and average age of school leaving fell. By contrast, from 1970 through the late-1980s, the time gap grew as increases in average age at marriage outpaced increases in average age at school leaving. Mare (1991) finds that these trends provide a partial explanation of trends in intermarriage among those with high levels of education. The predicted direction of trends through the 1990s are ambiguous, however, because both age at marriage and educational attainment have increased for men and women since the late-1980s (Casper and Bianchi 2002; U.S. Census Bureau 2004). Nonetheless, the expansion of education itself may result in higher levels of educational resemblance if individuals are increasingly homogenous in their ultimate educational attainment at each successive stage of the educational process (Blau and Duncan 1967:356; Blossfeld and Timm 2003:4; Mare 1991:16) or as educational institutions replace the influence of "third parties" (e.g., religious institutions, parents) over marriage decisions (Kalmijn 1991a).

A second explanation centers on increases in the symmetry of men's and women's preferences for partners. As gender roles have become increasingly egalitarian, men may have begun to compete for high-earning women just as women have traditionally competed for high-earning men (England and Farkas 1986:182; Oppenheimer 1994:332-34; Mason and Jensen 1995:3; Mare 1991). To the extent that earnings are correlated with education, increased sex symmetry in the competition for mates implies increased educational assortative marriage.[1] Empirical evidence supports this claim suggesting that the "marriage penalty" women pay for being highly educated is declining or, by some estimates, may have even reversed in recent years (Goldstein and Kenney 2001; Rose 2004) and that high-earning men are more likely to pair with high-earning women than in the past (Sweeney and Cancian 2004). Although these results may be a function of changes in availability (e.g., high-earning men and women may now be in closer physical proximity to each other because of decreases in the sex-segregation of work and leisure activities) rather than changes in preferences *per se*, they nevertheless imply greater symmetry in partner choice, which may result in higher levels of educational resemblance between spouses.

A third explanation points to increases in the economic differentiation of education groups. Increases in inequality in the U.S. over the past several decades may have reduced the likelihood of educational intermarriage by increasing the social distance between education groups (Blau 1977; Fernández, Guner, and Knowles 2005; Rytina, et al. 1988; Smits, Ultee, and Lammers 1998). If education is correlated with other characteristics that are also important in selecting a partner (e.g., expected earnings, abilities, attitudes, life styles, nativity, language), the tendency for couples to match on education may increase as differences across education strata in these associated characteristics increase. Because earnings differentiation by education has increased over the last half of the Twentieth Century, but especially since the late-1970s (Goldin

and Katz 2000; Gottschalk 1997; Katz and Murphy 1992), the social distance between education groups may have also grown, thereby resulting in lower intermarriage rates across education barriers. This hypothesis suggests a feedback mechanism between inequality and assortative marriage in which increased inequality decreases intermarriage, which further increases inequality in the next generation (Kremer 1997; Fernández et al. 2005).

In addition to these explanations, assortative marriage occurs in the context of other trends in marital behavior and the rise of non-marital unions. One trend is the rapid rise of cohabitation. If cohabitation functions as a "trial marriage" that weeds out educationally dissimilar couples (Blackwell and Lichter 2000, 2004; Gwartney-Gibbs 1986:432) then increases in cohabitation may increase the educational resemblance of spouses. However, empirical studies of the resemblance between partners in cohabiting and marital unions provide mixed support for this hypothesis in the cross-section (Blackwell and Lichter 2000, 2004; Jepsen and Jepsen 2002; Schoen and Weinick 1993), and studies of historical trends in the educational resemblance of pooled samples of cohabiting and marital unions differ little from trends in marital unions alone (Qian and Preston 1993:492). Another trend is the declining percentage of men and women who ever marry. Although the vast majority of persons (approximately 90%) still marry by age 35 (Casper and Bianchi 2002:18), increases in non-marriage may contribute to rising marital homogamy if increases in individuals' standards for marriage in general and their partners in particular (e.g., Cherlin 2004; Edin, Kefalas, and Reed 2004) lead them to choose partners who are more similar to themselves. An offsetting force, however, may be the declining availability of "economically attractive" men with low levels of education. The declining availability of men, especially among African Americans, may have forced women to broaden

their search for marriage partners, thereby reducing marital homogamy (Spanier and Glick 1980; but see Lichter, Anderson, and Hayward 1995).

Whereas the arguments outlined above generally point to continued increases in homogamy through the 1990s, they are not mutually exclusive and may pertain to different parts of the education distribution during different periods. In this paper, we do not adjudicate among hypotheses, but rather document recent and long-run trends in educational assortative marriage. We further discuss their possible causes in the conclusion.

DATA AND METHODS

We use Decennial Census data from the Integrated Public Use Microdata Series (IPUMS) and Current Population Survey (CPS) data to examine educational assortative marriage patterns from 1940 to 2003. We use two samples from these sources: (1) a sample of prevailing marriages in which the wife is 18 to 40 years old, regardless of the marriage parity of either partner (N=1,998,956); and (2) a sample of newlywed couples in which the wife is 18 to 40 and in which her first marriage occurred within one or two years of the interview date, depending on the data source (N=73,904) (see Appendix Table 1 for details on data sources and sample selection). We limit our analysis to wives age 18 to 40 because this age range covers most married couples with co-resident children.[2]

Our sample of prevailing marriages is drawn from the 1940, 1960, 1970, 1980, 1990, and 2000 Censuses, the March, June, and October supplements of the CPS from 1962 to 1978, and all 12 months of the CPS from 1979 through 2003. These data provide a detailed time series from 1960 through 2003, with a gap from 1940 to 1960. This gap arises because the 1950

Census does not contain education information on both members of a couple and therefore cannot be used in the analysis. Furthermore, although the CPS has been administered since the 1940s, the earliest microdata available are for March 1962. Despite the gap between our 1940 and 1960 data points, we include 1940 to extend the time series and for comparability with Mare (1991).

Our sample of newlyweds is drawn from data for which wife's date of first marriage or age at first marriage information is available. Only the June CPS for 1971, 1973-1977, 1979-1983, 1985-1988, 1990, 1992, 1994, and 1995 and from the 1940, 1960, 1970, and 1980 Censuses contain this information.

Measurement of Educational Attainment

Our analysis of historical trends in educational assortative marriage is complicated by a change in the wording of the educational attainment question, which was implemented by the CPS in January 1992 and by the Census in 1990. The major difference between the new and the old version of the question is that the old version elicits a numeric response to the question "What is the highest grade or year of regular school…has ever attended?" whereas the new version identifies specific degree completion levels beginning with "high school graduate – high school diploma or the equivalent" and ending with "doctorate degree."[3] To establish a single classification of educational attainment for all years, we follow the procedure for maximizing comparability between the old and new questions outlined by Jaeger (1997) and Park (1996). We classify each spouse into one of five categories of highest year of schooling (<10, 10-11, 12, 13-15, ≥16). For the old question in 1940, persons were classified by highest grade completed.

For the old question in the 1960-1980 Censuses and the 1962-1991 CPS's, persons are classified by highest grade completed except for those who attended 13 years but completed only 12 whom we nonetheless allocate to the 13-15 category (attended some college). For the new question in the 1990-2000 Censuses and the 1992-2003 CPS's, persons are classified by their highest grade of schooling up through "high school diploma or the equivalent" into the <10, 10-11, and 12 year categories. Persons who completed 12 years but did not graduate are classified as completing 12 grades. Persons with "some college, no degree" or an Associate degree are classified as 13-15. Persons with a Bachelor's degree or higher are classified as ≥16.

Log-Linear Models

We describe changes in patterns of educational assortative marriage using log-linear models for contingency tables (e.g., Agresti 2002). Log-linear models are appropriate because they provide estimates of the changing association between couples' educational characteristics while controlling for shifts in their marginal distributions. Our contingency table is produced by cross-classifying husband's highest year of schooling completed (<10, 10-11, 12, 13-15, ≥16) with wife's highest year of schooling completed (<10, 10-11, 12, 13-15, ≥16) by year (1940, 1960, 1962, 1964,…,2003 for prevailing marriages and 1940, 1960, 1970, 1971, 1973,…,1977, 1979,…,1983, 1985,…,1988, 1990, 1992, 1994, 1995 for newlyweds) and data source (Census, CPS). For prevailing marriages, there are 47 unique combinations of year and data source, yielding a 5 X 5 X 47 = 1,175 cell table. For newlyweds, there are 23 unique combinations of year and data source, yielding a 5 X 5 X 23 = 575 cell table. Because our samples of newlyweds from the CPS are small within years, we present trends in the association between husband's and

wife's education for newlyweds in 1940, 1960, 1970, 1971-1974, 1975-1979, 1980-1984, 1985-1989, and 1990-1995, but control for single-year changes in the marginal distributions of spouse's education by data source.

Our goal is to represent changes in the association between husband's and wife's education in a parsimonious yet accurate way. Several previous studies have relied on relatively complex representations of changes in the association (e.g., Mare 1991; Kalmijn 1991a, 1991b; Qian 1998). These studies use models that fit the data well, but do not provide a straightforward measure of changes in the educational resemblance of spouses. In this paper, we provide both a summary measure and a more nuanced accounting of changes in assortative marriage.

We use *homogamy* models to provide summary estimates of trends and *crossings models* to better understand which parts of the education distribution generate trends in the homogamy parameters. Homogamy models represent the association between husband's and wife's education in terms of a single parameter that represents the odds that husbands and wives share the same rather than different education levels. Crossings models represent the association between spouses' education as a series of barriers to marriage between education groups, or in terms of the relative permeability of boundaries between adjacent education groups. Past research has found that these models tend to fit marriage data well (Blackwell 1998; Johnson 1980; Mare 1991).

We start with a baseline model in which the association between husband's and wife's education is assumed to be time-invariant. Because our primary concern is with describing *trends* in the educational resemblance of spouses, we saturate the cross-sectional interaction between husband's and wife's education and focus on more parsimonious representations of changes in the association. Thus, our baseline model for prevailing marriages is:

$$\log(\mu_{ijkl} / t_{ijkl}) = \lambda + \lambda_i^H + \lambda_j^W + \lambda_k^S + \lambda_l^Y + \lambda_{ij}^{HW} + \lambda_{ik}^{HS} + \lambda_{il}^{HY} + \lambda_{jk}^{WS} + \lambda_{jl}^{WY} + \lambda_{kl}^{SY} + \lambda_{ikl}^{HSY} + \lambda_{jkl}^{WSY} + \lambda_{ijk}^{HWS} \quad (1)$$

where H is husband's education (i = 1,…,5), W is wife's education (j = 1,…,5), Y is year (l = 1,…,43), and S is data source (k = 0,1). Thus, μ_{ijkl} is the expected number of marriages between husbands in education category i and wives in education category j in year l from data source k. This model captures variation in the distribution of husband's and wife's education by year and data source (λ_{ikl}^{HSY} and λ_{jkl}^{WSY}), allows the interaction between husband's and wife's education to vary by data source (λ_{ijk}^{HWS}), and contains all lower order terms.

The Census and the CPS contain weights in most years to ensure that the samples are representative of the population. We use the wife's person weight for the couple for both the Census and the CPS with the exception of the 1960, 1970, 1980, and 1990 Censuses, which are self-weighting. We incorporate these weights in our models using an offset t_{ijkl} which is equal to the inverse of the total weighted frequency of the cell divided by the unweighted cell count (Agresti 2002:391; Clogg and Eliason 1988). To preserve our original sample size, we norm the original weights so that the sum of the weights equals the sample size within data sources, CPS months, and years. In cases where the cell frequency equals zero, we set t_{ijkl} to 1 (3.3% of cells for newlyweds and 0% of cells for prevailing marriages). The model for newlyweds replaces year l in equation (1) with year l' (l' = 1,…,22 where Y' = 1940, 1960, 1970, 1971, 1973,…,1977, 1979,…,1983, 1985,…,1988, 1990, 1992, 1994, 1995).

We add homogamy and crossings parameters to our baseline model shown above to estimate trends in assortative marriage. A homogamy model is:

$$\log(\mu_{ijkl} / t_{ijkl}) = \text{Baseline model} + \gamma_{ol}^{OY} \tag{2}$$

where $O = 1$ if husband's education category equals wife's education category and 0 otherwise, and γ_{ol}^{OY} estimates the change in the odds of homogamy in year l relative to the baseline year (1940). For newlyweds, year is expressed mainly in 5-year intervals in its interaction with homogamy ($l'' = 1,\ldots,7$) but is not constrained in the baseline portion of the model ($l' = 1,\ldots,22$).

A crossings model is:

$$\log(\mu_{ijkl} / t_{ijkl}) = \text{Baseline model} + \gamma_{ijl}^{HWY} \tag{3}$$

where

$$\gamma_{ijl}^{HWY} = \begin{cases} \sum_{q=j}^{i-1} \gamma_{ql} & for\ i > j, \\ \sum_{q=i}^{j-1} \gamma_{ql} & for\ i < j, \\ 0 & for\ i = j. \end{cases}$$

Here, γ_{ql} represents the change in the difficulty of crossing education barrier q in year l relative to the baseline year (1940). The log odds of intermarriage implied by this model are shown in Table 1. The crossings parameters are the log odds of marriage for couples in *adjacent*

education categories relative to the log odds of homogamy. The log odds of marriage for more educationally dissimilar couples are calculated by adding the crossings parameters that correspond to each barrier crossed (Johnson 1980:108-113; Powers and Xie:117-19).

The homogamy and crossings trends models are identical in the cross-section but make different assumptions about the sources of behavioral change over time. The homogamy trend model assumes that individuals' preferences for spouses who *share* their educational background or their opportunities for such marriages vary with time. By contrast, the crossings model assumes that trends in assortative marriage are produced by variation in individuals' *aversion* to marriage across particular education barriers or their lack of opportunities for such marriages. The concepts of homogamy and crossings are related but not identical. On the one hand, homogamous couples do not, by definition, cross any education barriers. On the other hand, couples who do not cross a given education barrier need not be homogamous.

RESULTS

Descriptive Statistics

Table 2 shows the weighted distribution of husband's and wife's education using Census data from 1940 to 2000. It shows the well known increases in educational attainment for both husbands and wives. Whereas the majority of husbands and wives had less than 10 years of education in 1940, less than 7% of husbands and wives had this level of schooling in 2000. As the proportion of husbands and wives with low levels of education dropped, the proportion of

married persons with 16 or more years of education increased from the single digits in 1940 to almost 28% in 2000.[4]

Although educational attainment has grown for both sexes, it has grown more for wives than for husbands. In 1940, 12% of husbands had completed at least some college compared to only 10% of wives, but by 2000 over 60% of wives had completed at least this much schooling compared to 57% of husbands. To investigate the implications of these changes for the tendency for men to marry less educated wives, we plot the percentage of couples in which the husband has more education than the wife (hypergamous couples), among those who do not share the same education (heterogamous couples). We show these trends by data source in Figure 1 for prevailing marriages (Panel A) and for newlyweds (Panel B).

For prevailing marriages, Figure 1 shows that the tendency for men to marry down follows a strong "inverted U" pattern which peaks in the mid-1970s. The overall trend and point estimates are very similar across data sources, although the proportion of heterogamous couples in which the husband has more education than the wife is slightly lower in the Census than in the CPS. Combining trends from both sources shows that the proportion of heterogamous couples in which the husband has more education than the wife increased from 45% in 1940 to over 60% in the mid-1970s before dropping back to 45% by 2003. Trends in the tendency for men to marry down can largely be traced to trends in the marginal distributions of husband's and wife's education (Table 2). In 1940, hypergamy was low because a greater proportion of husbands than wives had less than 10 years of education (60% vs. 53%, respectively). After 1940, hypergamy increased as the pace of husbands' entry into higher education exceeded wives'. Then, from 1970 to 2000, the pace of wives' entry into higher education exceeded husbands', such that in 2000 wives were more likely than husbands to have completed at least 13 years of schooling.

Thus, today as in 1940, if one partner in a marriage has more education than the other, it is likely to be the wife (also see Qian 1998:289).[5]

These trends are similar for newlyweds through the 1990-1995 period except that the balance of who has more education than whom tips towards the wife earlier than for prevailing marriages. For newlyweds, wives became more likely to marry down rather than up in the late-1980s whereas this did not occur for prevailing marriages until the mid-1990s. This shows the "lead and lag" relationship between trends for newlyweds and prevailing marriages. As mentioned above, the extent to which trends for prevailing marriages lag trends for newlyweds depends on the width of the age range examined and marital duration. Because our prevailing marriage sample comprises wives age 18 to 40, almost half the sample "ages out" of the analysis each decade and thus our prevailing marriage sample tracks trends for newlyweds relatively closely.

A simple measure of change in the resemblance between spouses is the change in the proportion of couples who share the same education category (homogamous couples). Figure 2 shows this trend using Census and CPS data for prevailing marriages and newlyweds. Again, trends in educational homogamy are very similar across data sources although the Census shows slightly lower percentages of homogamous couples than does the CPS. Because the Census is a one-time self-administered survey and CPS sample members are interviewed up to eight times by trained interviewers, responses to the Census education question may contain more measurement error than the CPS (Black, Sanders, and Taylor 2003). Given a tendency toward educational homogamy, random measurement error would tend to produce lower estimates of the percentage of couples who are homogamous. This may explain the slightly lower percentage of hypergamous couples in the Census as well. Taken together, however, trends from the Census

and CPS show that the percent of couples who share the same education category declined from 1940 to 1960 but has increased steadily since then. From 1940 to 1960 the percentage of educationally homogamous couples in prevailing marriages fell from almost 60% to 45% before rising to about 55% in 2003. The bottom panel of Figure 2 shows that the drop in the percent homogamous from 1940 to 1960 was not as sharp for newlyweds as for prevailing marriages but that the magnitude of the increase from 1960 through the early-1990s is similar across samples.

Figure 2 implies that the percentage of couples who differ by at least one education category has declined sharply since 1960, but it is also instructive to examine trends in the proportion of married couples who marry across larger educational divides. Figure 3 shows that the proportion of couples who differ by at least two education categories has also declined since 1960 for both prevailing marriages and newlyweds. However, unlike the trend in homogamy, this trend appears to have leveled off in the early-1990s. The trends for newlyweds are similar although the decline in the percent crossing two or more barriers from the early-1970s through the early-1990s is less steep than for prevailing marriages.

These trends should be interpreted with caution, however, as they may be highly influenced by changes in the marginal distributions of husbands' and wives' education. For example, the percentage of marriages that are homogamous may be higher in 1940 than in other years because of the high concentration of husbands and wives in the less than 10 years of schooling category. Even given a constant association between the education levels of husbands and wives, periods in which the marginal distributions are highly concentrated tend to produce a higher percentage of homogamous marriages. Furthermore, net of other changes, increases in the symmetry of husbands' and wives' educational attainment also tend to increase the similarity of spouses (Simkus 1984). While the increase in the percentage of couples who share the same

education level is suggestive, we wish to determine whether the strength of the association between husbands' and wives' education has increased, or whether this trend is altered once we control for shifts in the marginal distributions of husband's and wife's education. We accomplish this goal using log-linear models, which estimate trends in assortative marriage controlling for shifts in the distributions of spouses' education.

Log-linear Models

Table 3 provides the model specifications and fit statistics of our log-linear models. We present both the G^2 and the Bayesian information criterion (BIC) statistics for model fit but rely mainly on the BIC because of our large sample sizes (Raftery 1995). More negative BIC statistics indicate a better fitting model. Table 3 shows that the baseline model (Model 1), which assumes that the educational resemblance of spouses is time-invariant, fits the data poorly relative to models that allow for changes in educational assortative marriage.

In Models 2, 3, and 4, we examine different parameterizations of trends in assortative marriage. Model 2 is the homogamy trend model (equation 2), which parameterizes the trend as a change in the likelihood that husbands and wives share the same education level. By the BIC, adding these terms improves the fit of the model relative to the baseline model, indicating that the tendency for couples to marry within the same education category has changed significantly over the period we examine. This simple model, however, may conceal significant variation in trends across different portions of the education distribution. To address this, Model 3 allows for variation in homogamy trends across the main diagonal (M). By the BIC, Model 3 fits the data better than Model 2, indicating that trends in the odds of homogamy cannot be adequately be

described by a single parameter. Model 4 is the crossings trend model (equation 3) which adds terms to capture variation in the difficulty of crossing education barriers across the education distribution. By the BIC, the crossings model provides a better fit to the data than either the reduced or expanded forms of the homogamy trend models (Models 2 and 3). These results suggest that trends in assortative marriage are not adequately summarized by variation in individuals' preferences for educational resemblance or their opportunities for such marriages. Instead, they are better explained by variation in the strength of barriers to intermarriage across educational boundaries.

Models 5 through 7 include interactions between the time-varying association parameters and data source to test the hypothesis that trends in the association between husband's and wife's education vary by source (S). The BIC statistics are less negative in Models 5 through 7 than their counterparts in Models 2 through 4 and, because of our very large sample sizes, we conclude that Models 2 through 4 are preferable – that is, that estimates of trends in assortative marriage in these models do not vary by data source.

Models 8 and 9 include the parameters contained in Model 4 as well as additional terms for changes in the diagonal of the table (homogamy). Model 8 includes indicators of changes in whether or not the couple shares the same education level. Model 9 allows the trend in the odds of homogamy to vary depending on education level. By the BIC, neither of these more complex models fits the data better than Model 4. This indicates that, once the cross-sectional relationship between husband's and wife's education is taken into account, trends in assortative marriage are adequately described by changes in the degree to which couples cross education barriers.[6]

Although the homogamy model (Model 2) does not fit the data as well as the crossings model (Model 4), we present these trends for descriptive purposes. The poor fit of the homogamy model relative to the crossings model indicates that trends in the odds of crossing education barriers are not simple reflections of a more general trend toward higher levels of homogamy. Thus, we provide a more detailed description of trends using the crossings model, which allows us to gain insight into which parts of the education distribution generate the trends in homogamy we observe.

Trends in the Odds of Homogamy

Figure 4 shows the trend in the odds that husbands and wives share the same education category estimated from Model 2.[7] Net of changes in the marginal distributions of husband's and wife's education, the odds of homogamy for prevailing marriages dropped from 1940 to 1960 but increased substantially from 1960 to 2003. This figure also reveals that, in contrast to the percentages reported in Figure 2, in which the percent homogamous was higher in 1940 than in 2003, the odds of educational homogamy are higher today than in any period over the past 60 years. Today, husbands and wives are roughly 4 times as likely to have a spouse who shares their educational background as they are to be married to someone who does not, up from slightly more than 3 times the odds of heterogamy in the early-1960s. Although the odds of homogamy are clearly higher in the 1990s than in earlier decades, the results shown here are consistent with both a steady increase in the odds of homogamy or, possibly, a slowing of the upward trend since the 1990s. In either case, the main trend over the past 40 years is one of continued increase in the odds of homogamy.

Newlyweds tend to be less homogamous than prevailing marriages in most years but the general trend toward higher odds of homogamy since 1960 holds. After a drop in the odds of homogamy in the late-1970s, the odds of homogamy increase rapidly in the mid-1980s and early-1990s. Selective marital dissolution may play a role in explaining the higher odds of homogamy for prevailing marriages than for newlyweds. Heterogamous marriages are more likely to dissolve than homogamous marriages, although these effects are largely confined to couples in which the wife has more education than her husband (Bumpass and Sweet 1972; Bumpass, Castro Martin, and Sweet 1991; Goode 1956; Kalmijn 2003; Tzeng 1992; but see Tzeng and Mare 1995). Despite differences in levels of homogamy, the relatively sharp increase in the odds of homogamy for newlyweds since the mid-1980s suggests that we may see further increases in the educational resemblance of spouses in prevailing marriages in the future.

Trends in the Odds of Crossing Education barriers

To see where in the education distribution these increases in homogamy arise, we turn to an examination of the crossings parameters. Figure 5 shows trends in difficulty of crossing adjacent education barriers in the U.S. from 1940 to 2003 estimated from Model 4. The top panel shows the difficulty of crossing the two barriers at the lower end of the education distribution, that is, the difficulty of crossing the education barriers separating (1) those with less than 10 years of schooling and those with 10-11 years of schooling and (2) those with 10-11 years of schooling and high school graduates (12 years of schooling). The bottom panel shows the difficulty of crossing the two barriers at the upper end of the education distribution, that is, the difficulty of crossing the education barriers separating (1) high school graduates and those with "some college" (13-15 years of schooling) and (2) those with "some college" and those with bachelor's,

professional, or graduate degrees (16 or more years of schooling). Larger crossings parameters correspond to higher odds of intermarriage and thus indicate more permeable barriers. Smaller numbers correspond to lower odds of intermarriage and indicate less permeable barriers.

Table 4 complements Figure 5 by showing the odds of intermarriage implied by Model 4 for more distant as well as for adjacent education categories for three selected periods: 1940, 1970-1979, and 1995-2003. The odds of intermarriage between husbands and wives in adjacent education categories equal the average odds of intermarriage shown in Figure 5 across a given period. The odds of intermarriage between husbands and wives separated by more than one education barrier are the products of the odds ratios for each barrier that a marriage crosses (see Table 1). Because our model is symmetrical with respect to sex, we present the below-diagonal cells.

Figure 5 shows that the trends in the crossings parameters are generally consistent with the increase in the odds of homogamy shown in Figure 4. Although there are periods in which the odds of intermarriage across specific education barriers increase, the overall trend is toward decreasing odds of intermarriage. Nonetheless, Figure 5 shows that the increase in the odds of homogamy between 1960 and 2003 have arisen from different portions of the education distribution at different periods. Our results suggest that increases in homogamy were generated by increases in the rigidity of education barriers at the top of the education distribution from 1960 through the early-1970s, but from increasing rigidity at both ends of the distribution from the mid-1970s onward.

Specifically, from 1940 through the early-1970s, the odds of intermarriage across the three highest education barriers (i.e., 10-11/12, 12/13-15, and 13-15/≥16) dropped. For example, Table 4 shows that between 1940 and the 1970-1979 period intermarriage between college

graduates and those with "some college" decreased from 0.485 to 0.344 times the odds of homogamy, or by 29%. Similarly, the odds of homogamy between those with "some college" and high school graduates decreased from 0.467 to 0.374, or by 20%. The odds of intermarriage between high school graduates and those with 10-11 years of schooling also declined but less dramatically, falling by 3% between 1940 and the 1970-1979 period. By contrast, the odds of intermarriage between those with less than 10 and 10-11 years of schooling *increased* from 0.404 to 0.523 times the odds of homogamy over this period. The drop in the odds of homogamy between 1940 and 1960 can be traced to this increase. Because husband's and wife's education was concentrated in the lower portion of the distribution in these early years, the increase in the odds of marriage across the <10/10-11 barrier outweighs decreases in the odds of intermarriage at the upper end of the distribution, thereby generating a reduction in the odds of homogamy.

In the 1970s, trends in three of the four education barriers shifted. After decreasing from 1940 to the early-1970s, declines in the odds of intermarriage between college graduates and those with "some college" became more gradual or, possibly, stabilized in the 1970s and 1980s and declined in the 1990s. Regardless of the exact nature of the trend since the early 1970s, the odds of intermarriage between college graduates and those with "some college" are lower today than in any decade since 1940. The early-1970s also witnessed the beginning of a 30-year gradual increase in the odds of intermarriage between those with "some college" and high school graduates. By contrast, after rising through the mid-1970s, the odds of intermarriage across the lowest education barrier (<10/10-11) plummeted through the mid-1990s.[8] The trend in the odds of intermarriage across the 10-11/12 years of schooling barrier remained stable through the 1970s. The odds of intermarriage across this barrier declined consistently through the 1970s and

1980s, fluctuated in the early-1990s, and ended lower in the current period than in any other decade since 1940. Thus, the difficulty of crossing the three highest education barriers increased from 1940 through the early-1970s, whereas the difficulty of crossing barriers at both the top and bottom of the education distribution increased from the 1970s onward.[9] These trends are similar, albeit more variable for newlyweds through the mid-1990s (not shown).

What do these trends imply for the odds of marriage across more distant education barriers? Table 4 shows that although the barrier to marriage between college graduates and those with "some college" fell across each of the periods, the odds of intermarriage between college graduates and high school graduates remained stable between the 1970-1979 and 1995-2003 periods at 0.128 times the odds of homogamy. Here, the narrowing social distance between high school graduates and those with "some college" is offset by the widening social distance between those with "some college" and college graduates, resulting in no change in the odds of intermarriage between college graduates and high school graduates over the most recent period. This represents a significant shift from the early period in which the odds of intermarriage between high school graduates and college graduates dropped by 43%.

Although college graduates are no less likely to be married to high school graduates than they were the 1970s, intermarriage between college graduates and high school dropouts has declined consistently since 1940. The odds of intermarriage between college graduates and those with less than 10 years of schooling and those with 10-11 years of schooling have been cut in more than half since 1940 (i.e., from 0.043 to 0.019 and from 0.107 to 0.053, respectively). Indeed, high school dropouts have become less likely to marry anyone outside their own education group since the 1970s, a decline which is especially striking for those with less than 10 years of schooling.

Past research on trends from 1940 through the late-1980s and early-1990s has primarily emphasized decreases in the odds of intermarriage between college graduates and those with less education (Kalmijn 1991a; Mare 1991). Our results are similar to those reported by Mare (1991) through the late-1980s. However, our expanded time series reveals that the contribution of the growing separation of the highly educated from one another to increases in the odds of homogamy slowed or, in the case of high school graduates and those with "some college," reversed in the early-1970s. Since then, the largest declines in the odds of intermarriage have come from the bottom of the education distribution. The "rigidity" of education barriers across the entire spectrum of the education distribution has increased, but the timing of these changes varies. Nonetheless, the net effect of these trends is that the odds of intermarriage between those with higher levels of education and high school dropouts have continued to decline.

SUMMARY AND CONCLUSIONS

The increasing resemblance of spouses on educational attainment noted by other researchers through the late-1980s continued through the 1990s. The odds of educational homogamy are higher today than in any other decade since 1940, although there is evidence of a possible slow-down of these trends over the past decade. Our analyses of the 1940-2003 period indicates that increases in the odds of homogamy were generated by different portions of the education distribution in different periods. From 1960 to the early-1970s these increases came from decreases in intermarriage among groups of relatively well educated persons. College graduates, in particular, were increasingly likely to marry each other rather than persons with less education. Beginning in the 1970s, however, continued increases in the odds of educational

homogamy came from decreases in intermarriage at both the top and the bottom of the education distribution and were mitigated by increases in intermarriage in the middle of the distribution. These trends are similar for a broad cross-section of married couples and for recently married couples.

Previous interpretations of variation in assortative marriage provide only a partial account of the trends shown here. First, trends in the odds of intermarriage at the top of the education distribution are partially consistent with Mare's (1991) hypothesis that the odds of crossing an education barrier are positively associated with the time gap between school completion and marriage. Mare (1991) finds that the time gap between school completion and marriage declined from 1940 to 1970 and increased through the late-1980s. These trends are consistent with the decline in the odds of intermarriage at the top of the education distribution from 1940 through the early-1970s, but not with the continued decline in the odds of intermarriage between college graduates and those with "some college" since the 1970s. However, they are consistent with the declining odds of intermarriage between high school graduates and those with "some college" through 1970 and the increase through 2003.

Second, trends in economic inequality across education groups since 1940 correspond relatively well to trends in the odds of homogamy, but less well to variation in the odds of crossing education barriers. Goldin and Katz (2000) argue that the history of economic inequality in the U.S. is a "tale of two half-centuries," with decreasing wage inequality by education from 1910 to 1950 and increasing inequality thereafter, with the exception of the 1970s when earnings differentials by education contracted. This trend parallels the drop in the odds of homogamy from 1940 to 1960 and the increase thereafter. However, the trend in inequality is inconsistent with the steady decline in the odds of crossing barriers at the top of the

education distribution from 1940 to the early-1970s and the increase in the odds of crossing education barriers in the middle portion of the distribution from the early-1970s on. Trends in inequality are, however, consistent with the decline in the odds of marriage between high school dropouts and those with more education since the 1970s, a period over which the real wages of men in this education group declined (Mishel et al. 2005:152).

Third, increasing competition for high-earning, highly-educated partners may have contributed to increases in the resemblance of spouses. As women's labor force participation and earnings have increased, men may have begun to compete for high-earning highly-educated women as women have traditionally competed for high-earning men (England and Farkas 1986:182; Oppenheimer 1994:332-334; Mason and Jensen 1995:3; Mare 1991). Moreover, as women's earnings have increased, their incentives to remain with husbands who have poor or declining economic prospects may have also diminished. Although these explanations are consistent with the overall increase in the educational similarity of spouses, it is not clear whether they explain variation in the timing of trends in the odds of intermarriage across specific education barriers.

Further research on trends in educational assortative marriage should include analyses of the time varying effects of inequality among education groups, the timing of schooling and marriage, and the roles and statuses of men and women in marriage and the labor market. In addition, it is important to recognize the potential impact of other key demographic and social trends on educational assortative marriage. One trend is the shifting race/ethnic makeup of education groups. The rapid growth of the low-education immigrant population in recent decades (Borjas, et al. 1997), combined with ethnic, linguistic, and other cultural patterns of marital endogamy (Qian and Lichter 2001; Stevens and Schoen 1988; Stevens and Swicegood

1987), may have decreased the likelihood of intermarriage among those with low levels of education. Another explanation concerns changes in the structure of education. The organization of post-secondary education, especially the expansion of community colleges, vocational, and other adult education programs (Cohen and Brawer 2004; Kane and Rouse 1999), may have decreased the social distance between persons who have completed "some college" and those with just a high school degree, at the same time as it has widened the gap between those with "some college" and four-year college graduates. Finally, increased social barriers to intermarriage across education groups may have resulted from the increased concentration of highly educated persons in urban areas and the growing spatial segregation of income groups more generally (Costa and Kahn 2000; Jargowsky 1996).

Whatever the specific sources of increase in the educational resemblance of spouses, these trends are a potential source of increased income inequality across families because of the positive relationship between education and earnings. Moreover, to the extent that children inherit the education characteristics of their parents, the increasing resemblance of spouses may contribute to increasing inequality across generations. Regardless of the effects of marriage patterns on inequality, however, the increasing educational resemblance of spouses points to increasing social closure, a trend that is consistent with the growing economic and cultural separation between education groups in the U.S.

ENDNOTES

[1] An alternative argument is that as women's earnings potential increases and the gender gap in earnings narrows, women can afford to choose partners based on "love" rather than "money," thus reducing marital sorting on education (Fernández, Guner, and Knowles 2005).

[2] Including young wives in our analysis may affect our estimates of trends in educational assortative marriage because of shifts in the timing of marriage and the improbability of obtaining high levels of schooling at young ages. In analyses not shown here, we examined trends for wives in prevailing marriages between the ages of 21 and 40. The results are very similar to those presented here.

[3] The categories in the new education question are: less than 1st grade; 1st-4th grade; 5th or 6th grade; 7th or 8th grade; 9th grade; 10th grade; 11th grade; 12th grade – no diploma; high school graduate – high school diploma, or the equivalent; some college but no degree; Associate degree in college – occupational/vocational program; Associate degree in college – academic program; Bachelor's degree; Master's degree; professional school degree; and Doctorate degree.

[4] Table 2 also illustrates the relevance of our education classification. Although the proportion of individuals with less than 10 years of schooling today is small, these individuals represent a large share of married persons historically. If we were focusing on assortative marriage in more recent decades alone we might safely collapse all those with less than 12 years of schooling into a single category and distinguish between those with college degrees and those with graduate or professional degrees. For the majority of the period studied, however, husbands and wives with graduate or professional degrees represent a trivial proportion of our sample. In analyses not shown here, we replicated our analysis for prevailing marriages using alternative education classifications. We discuss the results of these analyses below.

[5] Rose (2004) also finds that hypergamy decreased from 1980 to 2000 but that the number of hypogamous marriages had not exceeded the number hypergamous marriages by 2000. The discrepancy between Rose's results and the present analysis is explained by differences in the age range of our samples. Whereas we examine couples in which the wife is aged 18 through 40, Rose examines couples in which the wife is between 40 and 44.

[6] For newlyweds, the baseline model (Model 1) fits the data adequately relative to other models by the BIC. However, by the G^2 criterion, the crossings model (Model 4) provides a better fit than the baseline model ($G_1^2 - G_4^2 = 94$; df = 28; $p < 0.001$), as does the homogamy model (Model 2) ($G_1^2 - G_2^2 = 19$; df = 7; $p = 0.008$).

All of the models presented here assume that trends in the pattern of association between husband's and wife's education are symmetrical with respect to sex. Adding parameters that capture trends in the tendency for women to marry up or down (vs. homogamously) net of the marginal distributions does not improve the fit of our preferred model (Model 4) by the BIC. Thus, once time-invariant asymmetry in assortative marriage is taken into account, trends in the crossings parameters are symmetrical with respect to sex (results available upon request). These results may nonetheless be consistent with historical increases in hypergamy, which are a function of changes in both the marginal distributions of husband's and wife's education and the relative odds of hypergamous and hypogamous marriages net of the marginals.

[7] Our models do not produce interpretable coefficients for the odds of homogamy and the odds of crossing education barriers for the omitted year (1940) because of the inclusion of the interaction terms between husband's and wife's education (HW), which control for the time-invariant association between spouses' educational characteristics. We estimate the odds of homogamy and the odds of crossing education barriers for 1940 using modified versions of

Models 2 and 4 in which we replace the HW terms with homogamy (O) and crossings terms (C), respectively. The year-to-year change parameters are estimated from Models 2 and 4 and are added to the estimates for 1940. Throughout the paper, we estimate trends holding data source (S) constant at $S = 0$ (CPS).

[8] Unlike trends in the odds of crossing other education barriers, the trend in the odds of crossing the lowest educational barrier drops sharply in 1992, the year that the CPS began administering the new version of the education question. It is unclear how much of this drop is due to the change in the wording of the education question and how much is due to sampling variability. Our interpretation of trends in the odds of crossing the lowest educational barrier, however, is unaffected by the drop in the odds between these two years.

[9] We tested the significance of individual trends in the crossings parameters by selectively deleting each set of crossings/year interactions from Model 4. Each trend is statistically significant by the G^2 criterion. By the BIC, each trend is significant with the exception of the 10-11/12 years of schooling barrier.

Education classification schemes with 6 categories (< 10, 10-11, 12, 13-15, 16, > 16) and 7 categories (< 5, 5-9, 10-11, 12, 13-15, 16, > 16) produce trends in the odds of crossing education barriers and trends in the odds of homogamy that are very similar to those presented in Figures 4 and 5. Trends in the *percentage* of couples who are homogamous, however, are substantially reduced. By contrast to the 10 percentage point increase shown in Figure 2, the percent homogamous increases by about 5 percentage points using the 6-category classification and 7 percentage points using the 7-category classification. Nevertheless, these differences are largely eliminated once shifts in the marginal distributions are controlled for in our log-linear models. Because of the skewed nature of the education distribution in 1940, we also dropped

1940 from our analyses to determine the influence of this data point on our results. The trends shown here are robust to the exclusion of 1940. (Results available upon request.)

REFERENCES

Agresti, A. 2002. *Categorical Data Analysis.* Hoboken, NJ: John Wiley and Sons, Inc.

Black, D., S. Sanders, and L. Taylor. 2003. "Measurement of Higher Education in the Census and Current Population Survey." *Journal of the American Statistical Association* 98:545-554

Blackwell, D.L. 1998. "Marital Homogamy in the United States: The Influence of Individual and Paternal Education." *Social Science Research* 27:159-88.

Blackwell, D.L. and D.T. Lichter. 2000. "Mate Selection Among Married and Cohabiting Couples." *Journal of Family Issues* 21(3):275-302.

-------. 2004. "Homogamy Among Dating, Cohabiting, and Married Couples." *The Sociological Quarterly* 45(4):719-37.

Blau, P.M. 1977. *Inequality and Heterogeneity.* New York: The Free Press.

Blau, P.M. and O.D. Duncan. 1967. *The American Occupational Structure*. New York: The Free Press.

Blossfeld, H.-P. and A. Timm, eds. 2003. *Who Marries Whom? Educational Systems as Marriage Markets in Modern Societies.* Dordrecht: Kluwer Academic Publishers

Borjas, G.J., R.B. Freeman, L.F. Katz, J. DiNardo, J.M. Abowd. 1997. "How Much Do Immigration and Trade Affect Labor Market Outcomes?" *Brookings Papers on Economic Activity* 1997(1):1-90.

Bumpass, L.L. and H.-H. Lu. 2000. "Trends in Cohabitation and Implications for Children's Family Contexts in the United States." *Population Studies* 54(1):29-41.

Bumpass, L.L., and J.A. Sweet. 1972. "Differentials in Marital Instability: 1970." *American Sociological Review* 37:754-766.

Bumpass, L.L., T. Castro Martin, and J.A. Sweet. 1991. "The Impact of Family Background and Early Marital Factors on Marital Disruption." *Journal of Family Issues* 12:22-42.

Casper, L.M. and S.M. Bianchi. 2002. *Continuity and Change in the American Family*. Thousand Oaks, CA: Sage Publications.

Cavalli-Sforza, L.L. and M.W. Feldman. 1981. *Cultural Transmission and Evolution: A Quantitative Approach.* (Monographs in Population and Biology 16). Princeton: Princeton University Press.

Cherlin, A.J. 2004. "The Deinstitutionalization of American Marriage." *Journal of Marriage and Family* 66:848-861.

Clogg, C.C. and S.R. Eliason. 1988. "Some Common Problems in Log-Linear Analysis." Pp. 226-57 in *Common Problems/Proper Solutions: Avoiding Error in Quantitative Research*, edited by J.S. Long. Newbury Park, CA: Sage Publications, Inc.

Cohen, Arthur M. and Florence B. Brawer. 2003. *The American Community College.* San Francisco: Jossey-Bass.

Costa, D.L. and M.E. Kahn. 2000. "Power Couples: Changes in the Locational Choice of the College Educated, 1940-1990." *The Quarterly Journal of Economics* 115(4):1287-1315.

Edin, K., M.J. Kefalas, J.M. Reed. 2004. "A Peek Inside the Black Box: What Marriage Means for Poor Unmarried Parents." *Journal of Marriage and Family* 66:1007-14

Epstein, E. and R. Guttman. 1984. "Mate Selection in Man: Evidence, Theory, and Outcome." *Social Biology* 31:243-78.

England, P. and G. Farkas. 1986. *Households, Employment, and Gender: A Social, Economic, and Demographic View.* New York: Aldine de Gruyter.

Fernández, R. 2002. "Education, Segregation, and Marital Sorting: Theory and an Application to the UK." *European Economic Review* 46:993-1022.

Fernández, R. and R. Rogerson. 2001. "Sorting and Long-Run Inequality." *The Quarterly Journal of Economics* 116 (4): 1305-41.

Fernández, R., N. Guner, and J. Knowles. 2005. "Love and Money: A Theoretical and Empirical Analysis of Household Sorting and Inequality." *The Quarterly Journal of Economics* 120(1):273-344.

Goldin, C. and L.F. Katz. 2000. "Decreasing (and Then Increasing) Inequality in America: A Tale of Two Half-Centuries." Pp. 37-82 in *The Causes and Consequences of Increasing Inequality,* edited by F. Welch. Chicago: University of Chicago Press.

Goldstein, J.R. and C.T. Kenney. 2001. "Marriage Delayed or Marriage Forgone? New Cohort Forecasts of First Marriage for U.S. Women." *American Sociological Review* 66:506-19.

Goode, W.J. 1956 . *After Divorce.* Glencoe, IL: Free Press

Gottschalk, P. 1997. "Inequality, Income Growth, and Mobility: The Basic Facts." *The Journal of Economic Perspectives* 11(2):21-40.

Gwartney-Gibbs, P.A. 1986. "The Institutionalization of Premarital Cohabitation: Estimates from Marriage License Applications, 1970 and 1980." *Journal of Marriage and the Family* 48(2):423-34.

Jaeger, D.A. 1997. "Reconciling the Old and New Census Bureau Education Questions: Recommendations for Researchers." *Journal of Business and Economic Statistics* 15(3):300-309.

Jargowsky, P.A. 1996. "Take the Money and Run: Economic Segregation in U.S. Metropolitan Areas." *American Sociological Review* 61(6):984-98.

Johnson, R.A. 1980. *Religious Assortative Mating in the United States.* New York: Academic Press.

Jepsen, L.K. and C.A. Jepsen. 2002. "An Empirical Analysis of the Matching Patterns of Same-sex and Opposite-sex Couples" *Demography* 39(3):435-53.

Kalmijn, M. 1991a. "Shifting Boundaries: Trends in Religious and Educational Homogamy." *American Sociological Review* 56(6):786-800.

-------. 1991b. "Status Homogamy in the United States." *American Journal of Sociology* 97(2):496-523.

-------. 1994. "Assortative Mating by Cultural and Economic Occupational Status." *American Journal of Sociology* 100(2):422-52.

-------. 1998. "Intermarriage and Homogamy: Causes, Patterns, Trends." *Annual Review of Sociology* 24:395-421.

-------. 2003. "Union Disruption in the Netherlands." *International Journal of Sociology* 33(2):36-64.

Kane, T.J. and C.E. Rouse. 1999. "The Community College: Educating Students at the Margin Between College and Work." *The Journal of Economic Perspectives* 13(1):63-84.

Katz, L.F. and K.M. Murphy. 1992. "Changes in Relative Wages, 1963-1987: Supply and Demand Factors." *The Quarterly Journal of Economics* 107(1):35-78.

Kremer, M. 1997. "How Much Does Sorting Increase Inequality?" *The Quarterly Journal of Economics* 112(1):115-39.

Lichter, D.T., R.N. Anderson, M.D. Hayward. 1995. "Marriage Markets and Marital Choice." *Journal of Family Issues* 16(4):412-31.

Mare, R.D. 1991. "Five Decades of Educational Assortative Mating." *American Sociological Review* 56(1):15-32.

-------. 2000. “Assortative Mating, Intergenerational Mobility, and Educational Inequality.” California Center for Population Research Working Paper CCPR-004-00.

Mason, K.O. and A.-M. Jensen. 1995. “Introduction.” Pp. 1-14 in *Gender and Family Change in Industrialized Countries,* edited by K.O. Mason and A.-M. Jensen. Oxford: Clarendon Press.

Mishel, L., J. Bernstein, S. Allegretto. 2005. *The State of Working America 2004/2005*. Ithaca: Cornell University Press.

Oppenheimer, V.K. 1994. “Women’s Rising Employment and the Future of the Family in Industrial Societies.” *Population and Development Review* 20(2):293-342.

Park, J.H. 1996. “Measuring Education over Time: A Comparison of Old and New Measures of Education from the Current Population Survey.” *Economics Letters* 50:425-28.

Pencavel, J. 1998. “Assortative Mating by Schooling and the Work Behavior of Wives and Husbands.” *The American Economic Review* 88(2):326-29.

Powers, D.A. and Y. Xie. 2000. *Statistical Methods for Categorical Data Analysis*. San Diego: Academic Press.

Qian, Z. 1998. “Changes in Assortative Mating: The Impact of Age and Education, 1970-1990.” *Demography* 35(3):279-92.

Qian, Z. and D.T. Lichter. 2001. “Measuring Marital Assimilation: Intermarriage among Natives and Immigrants.” *Social Science Research* 30:289-312.

Qian, Z. and S.H. Preston. 1993. “Changes in American Marriage, 1972 to 1987: Availability and Forces of Attraction by Age and Education.” *American Sociological Review* 58(4):482-95.

Raftery, A.E. 1995. “Bayesian Model Selection in Social Research.” *Sociological Methodology* 25:111-63.

Raymo, J.M. and Y. Xie. 2000. “Temporal and Regional Variation in the Strength of Educational Homogamy.” *American Sociological Review* 65(5):773-81.

Rose, E. 2004. “Education and Hypergamy in Marriage Markets.” CSDE Working Paper No. 04-03. Center for Studies in Demography and Ecology, University of Washington.

Ruggles, S., M. Sobek, T. Alexander, C.A. Fitch, R. Goeken, P.K. Hall, M. King, and C. Ronnander. 2004. *Integrated Public Use Microdata Series: Version 3.0*. Distributed by the Minnesota Population Center, Minneapolis, MN.

Rytina, S., P.M. Blau, T. Blum, and J. Schwartz. 1988. "Inequality and Intermarriage: A Paradox of Motive and Constraint." *Social Forces* 66(3):645-75.

Schoen, R. and R.M. Weinick. 1993. "Partner Choice in Marriages and Cohabitations." *Journal of Marriage and the Family* 55:408-14.

Simkus, A.. 1984. "Structural Transformation and Social Mobility: Hungary 1938-1973." *American Sociological Review* 49(3):291-307.

Smits, J., W. Ultee, and J. Lammers. 1998. "Educational Homogamy in 65 Countries: An Explanation of Differences in Openness Using Country-Level Explanatory Variables." *American Sociological Review* 63:264-85.

-------. 2000. "More or Less Educational Homogamy? A Test of Different Versions of Modernization Theory Using Cross-Temporal Evidence for 60 Countries." *American Sociological Review* 65(5):781-88.

Spanier, G.B. and P.C. Glick. 1980. "Mate Selection Differentials Between Whites and Blacks in the United States." *Social Forces* 58(3):707-25.

Stevens, G. and R. Schoen. 1988. "Linguistic Intermarriage in the United States." *Journal of Marriage and the Family* 50(1):267-79.

Stevens, G. and G. Swicegood. 1987. "The Linguistic Context of Ethnic Endogamy." *American Sociological Review* 52(1):73-82.

Sweeney, M.M. and M. Cancian. 2004. "The Changing Importance of White Women's Economic Prospects for Assortative Mating." *Journal of Marriage and Family* 66:1015-1028.

Tzeng, M.-S. 1992. "The Effects of Socioeconomic Heterogamy and Changes on Marital Dissolution for First Marriages." *Journal of Marriage and the Family* 54(3):509-19.

Tzeng, J.M. and R.D. Mare. 1995. "Labor Market and Socioeconomic Effects on Marital Stability." *Social Science Research* 329-351.

Ultee, W.C. and R. Luijkx. 1990. "Educational Heterogamy and Father-to-Son Occupational Mobility in 23 Industrial Nations." *European Sociological Review* 6(2):125-49.

U.S. Census Bureau. 2002. *Current Population Survey: Design and Methodology.* Technical Paper 63RV. Washington, D.C.: U.S. Department of Labor, Bureau of Statistics and U.S. Department of Commerce, U.S. Census Bureau.

U.S. Census Bureau. 2004. "Table A-2. Percent of People 25 Years and Over Who Have Completed High School or College, by Race, Hispanic Origin and Sex: Selected Years 1940 to 2003." http://www.census.gov/population/www/socdemo/educ-attn.html

Table 1. Log Odds of Educational Intermarriage

Wife's Years of Schooling	Husband's Years of Schooling				
	< 10	10-11	12	13-15	≥ 16
< 10	1	γ_1	$\gamma_1+\gamma_2$	$\gamma_1+\gamma_2+\gamma_3$	$\gamma_1+\gamma_2+\gamma_3+\gamma_4$
10-11	γ_1	1	γ_2	$\gamma_2+\gamma_3$	$\gamma_2+\gamma_3+\gamma_4$
12	$\gamma_1+\gamma_2$	γ_2	1	γ_3	$\gamma_3+\gamma_4$
13-15	$\gamma_1+\gamma_2+\gamma_3$	$\gamma_2+\gamma_3$	γ_3	1	γ_4
≥ 16	$\gamma_1+\gamma_2+\gamma_3+\gamma_4$	$\gamma_2+\gamma_3+\gamma_4$	$\gamma_3+\gamma_4$	γ_4	1

Table 2. Distribution of Husband's and Wife's Eduation in Prevailing Marriages by Year (Wives 18-40): U.S., 1940-2003

Wife's Years of Schooling	Husband's Years of Schooling					
	< 10	10-11	12	13-15	≥ 16	Total
1940:						
< 10	43.99	4.45	3.12	0.78	0.40	52.74
10-11	7.33	3.88	2.61	0.69	0.36	14.87
12	6.55	3.60	8.13	2.29	1.91	22.48
13-15	1.32	0.67	1.47	1.58	1.62	6.66
≥ 16	0.32	0.16	0.47	0.54	1.75	3.24
Total	59.51	12.76	15.80	5.88	6.04	99.99
						N=158,512
1960:						
< 10	16.02	3.41	3.49	0.82	0.23	23.97
10-11	6.23	4.35	4.58	1.40	0.46	17.02
12	7.97	6.14	17.12	6.10	3.77	41.10
13-15	0.97	0.86	2.67	3.57	3.93	12.00
≥ 16	0.18	0.18	0.61	0.97	3.95	5.89
Total	31.37	14.94	28.47	12.86	12.34	100.00
						N=203,117
1970:						
< 10	7.94	2.41	3.09	0.69	0.21	14.34
10-11	4.13	3.63	4.88	1.37	0.38	14.39
12	5.77	5.47	21.86	8.27	4.44	45.81
13-15	0.71	0.85	3.38	5.27	5.48	15.69
≥ 16	0.20	0.18	0.89	1.54	6.95	9.76
Total	18.75	12.54	34.10	17.14	17.46	99.99
						N=208,093
1980:						
< 10	4.27	1.35	2.24	0.70	0.22	8.78
10-11	2.03	2.06	3.63	1.30	0.27	9.29
12	3.42	3.76	21.99	9.25	4.06	42.48
13-15	0.73	0.93	5.16	9.42	7.49	23.73
≥ 16	0.15	0.15	1.27	2.80	11.35	15.72
Total	10.60	8.25	34.29	23.47	23.39	100.00
						N=239,980
1990:						
< 10	2.68	0.68	1.31	0.53	0.14	5.34
10-11	0.84	1.25	2.33	0.82	0.15	5.39
12	1.89	2.57	18.09	9.57	3.24	35.36
13-15	0.68	0.98	8.45	14.40	7.83	32.34
≥ 16	0.14	0.17	2.00	4.76	14.51	21.58
Total	6.23	5.65	32.18	30.08	25.87	100.00
						N=238,372
2000:						
< 10	3.47	0.60	1.42	0.52	0.16	6.17
10-11	0.68	1.01	1.79	0.65	0.13	4.26
12	1.80	2.02	15.54	7.33	2.41	29.10
13-15	0.76	1.06	9.26	14.91	6.98	32.97
≥ 16	0.17	0.18	2.80	6.33	18.02	27.50
Total	6.88	4.87	30.81	29.74	27.70	100.00
						N=220,209

Notes: Totals may not sum to 100.00 because of rounding error. Results are weighted to correct for oversampling and sampling variability in 1940 and 2000.

Source: U.S. Census (IPUMS).

Table 3. Log-Linear Models of the Association Between Husband's and Wife's Education by Sample (Wives 18-40): U.S., 1940-2003

Model	df	G^2	BIC
(1) HYS, WYS, HWS	720	8076	-2370
(2) Model 1 + OY	678	6627	-3210
(3) Model 1 + MY	510	2799	-4600
(4) Model 1 + CY	552	2522	-5487
(5) Model 1 + OYS	675	6606	-3187
(6) Model 1 + MYS	495	2721	-4460
(7) Model 1 + CYS	540	2465	-5370
(8) Model 4 + OY	510	2102	-5297
(9) Model 4 + MY[a]	426	1635	-4545

Notes: N = 1,998,956; Cells = 1,175. Model terms (number of parameters): Y = Year (42); H = Husband's education (4); W = Wife's education (4); S = Data source (1); O = Homogamy (1); C = Crossings Parameters (4); M = Main diagonal (5).
Sources: Current Population Survey (CPS) and U.S. Census data (IPUMS).

[a]Only two of the four sets of crossings trend parameters are identified when the main diagonal trend parameters are included in the model (Powers and Xie 2000:118).

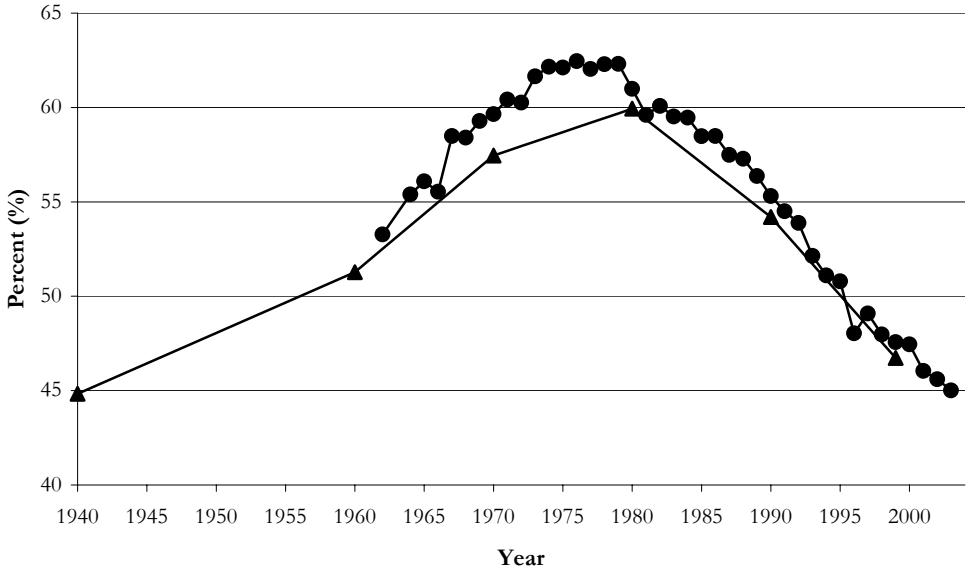
Table 4. Odds of Crossing an Educational Barrier Among Prevailing Marriages (Wives 18-40): U.S., 1940-2003

Wife's Years of Schooling	Husband's Years of Schooling			
	< 10	10-11	12	13-15
1940:				
10-11	0.404			
12	0.191	0.472		
13-15	0.089	0.220	0.467	
≥ 16	0.043	0.107	0.226	0.485
1970-1979:				
10-11	0.523			
12	0.240	0.459		
13-15	0.090	0.172	0.374	
≥ 16	0.031	0.059	0.128	0.344
1995-2003:				
10-11	0.357			
12	0.148	0.416		
13-15	0.061	0.170	0.409	
≥ 16	0.019	0.053	0.128	0.314

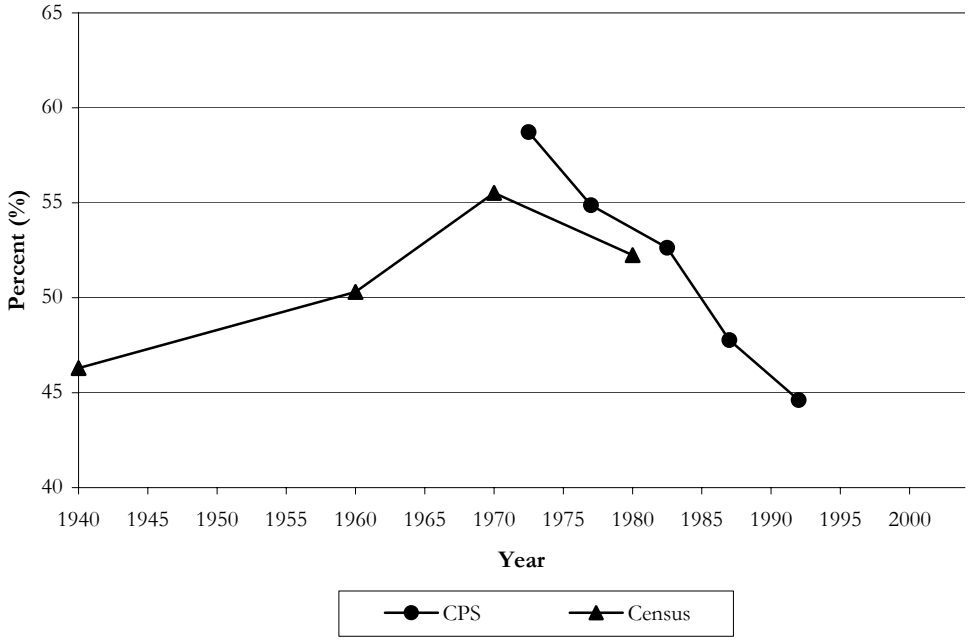
Sources: Current Population Survey (CPS) and U.S. Census data (IPUMS).

Figure 1. Percent Hypergamous Given Heterogamy by Data Source (Wives 18-40): U.S., 1940-2003

Panel A. Prevailing Marriages



Panel B. Newlyweds

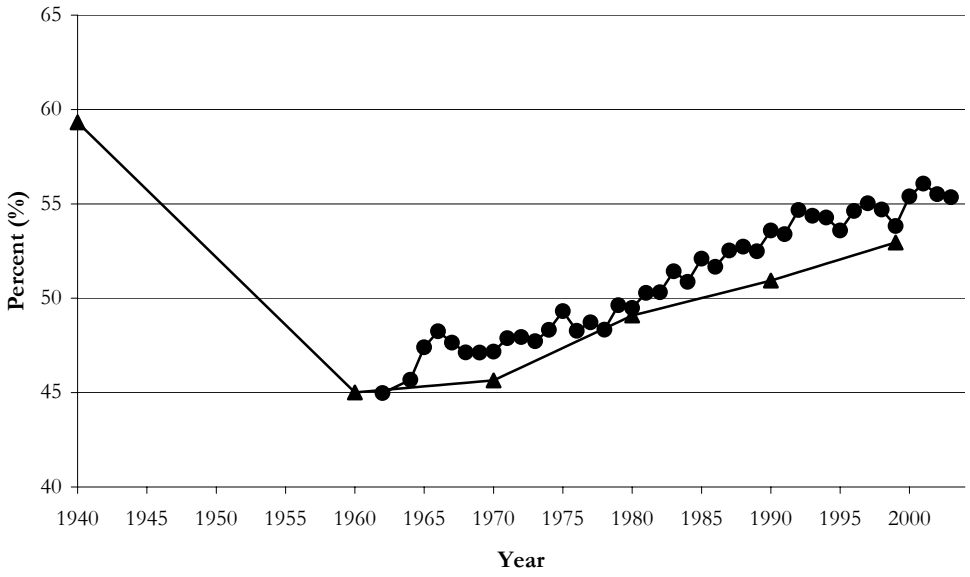


Notes: Results are weighted. Education categories are < 10, 10-11, 12 13-15, and ≥ 16 years of schooling. For newlyweds, available CPS years are grouped as follows: 1971-1974, 1975-1979, 1980-1984, 1985-1989, 1990-1995. They are graphed at their mid-point.

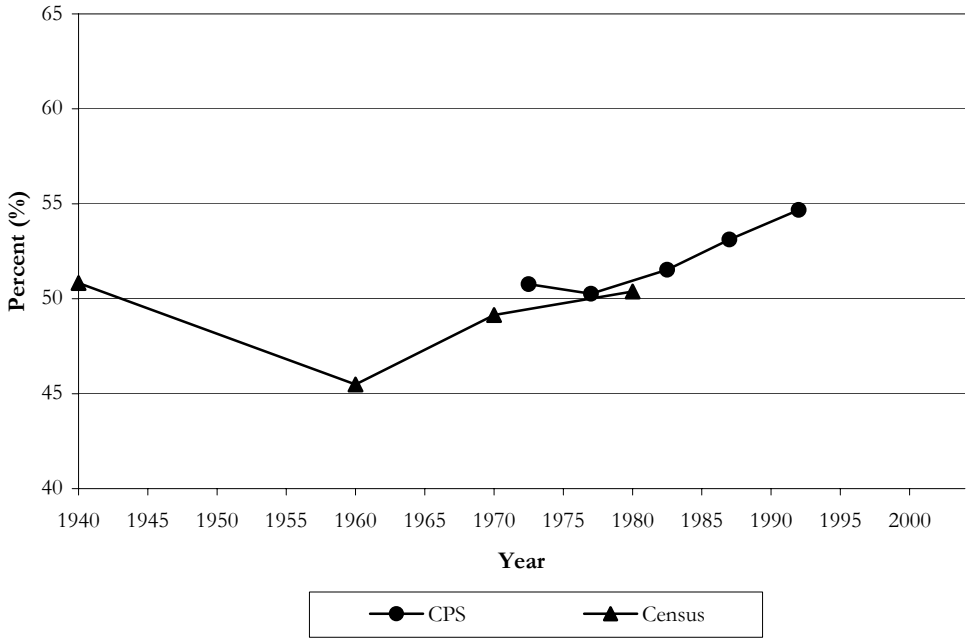
Sources: Current Population Survey (CPS) and U.S. Census (IPUMS).

Figure 2. Percent Homogamous by Data Source (Wives 18-40): U.S., 1940-2003

Panel A. Prevailing Marriages



Panel B. Newlyweds

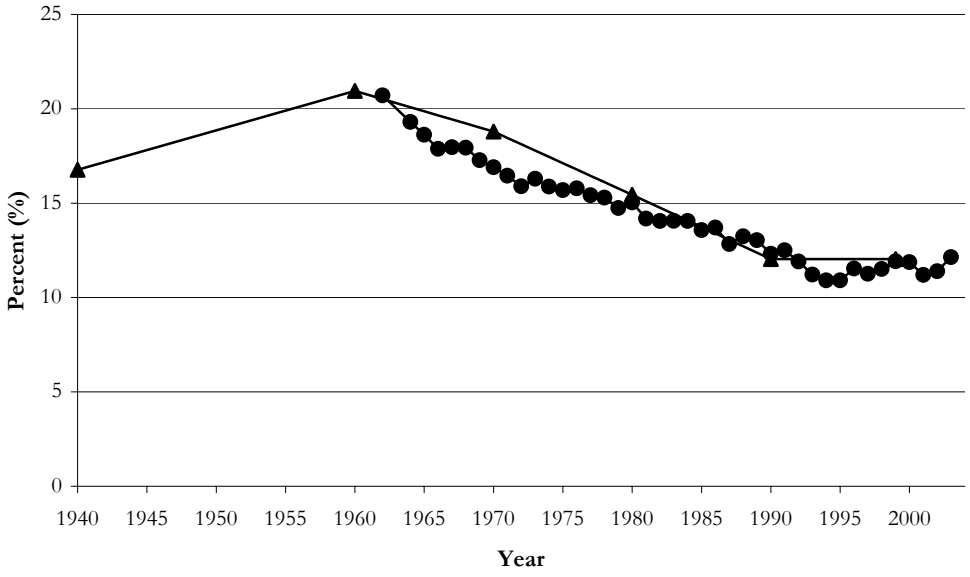


Notes: Results are weighted. Education categories are < 10, 10-11, 12 13-15, and ≥ 16 years of schooling. For newlyweds, available CPS years are grouped as follows: 1971-1974, 1975-1979, 1980-1984, 1985-1989, 1990-1995. They are graphed at their mid-point.

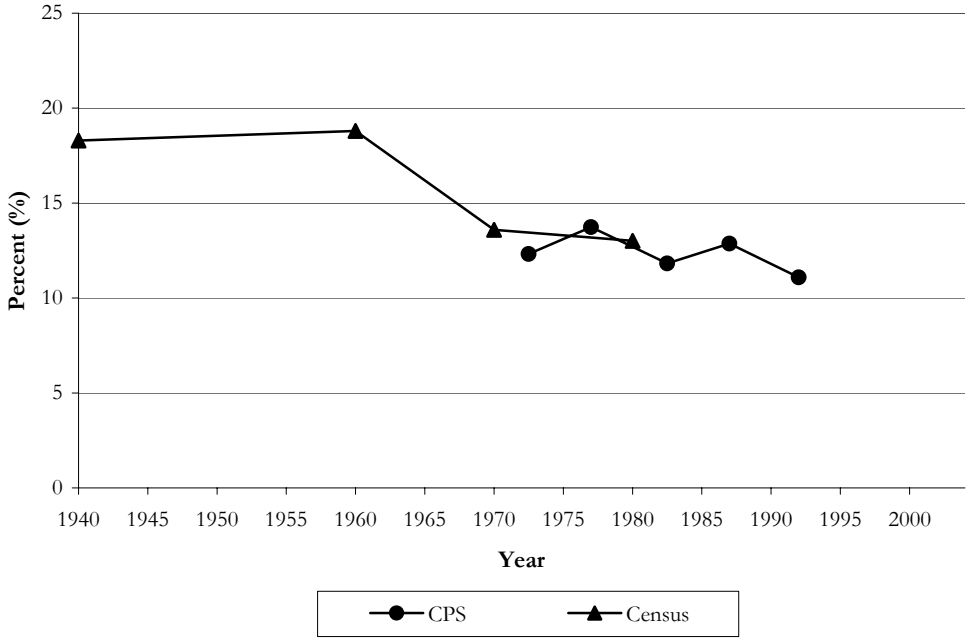
Sources: Current Population Survey (CPS) and U.S. Census data (IPUMS).

Figure 3. Percent Crossing Two or More Educational Categories by Data Source (Wives 18-40): U.S., 1940-2003

Panel A. Prevailing Marriages



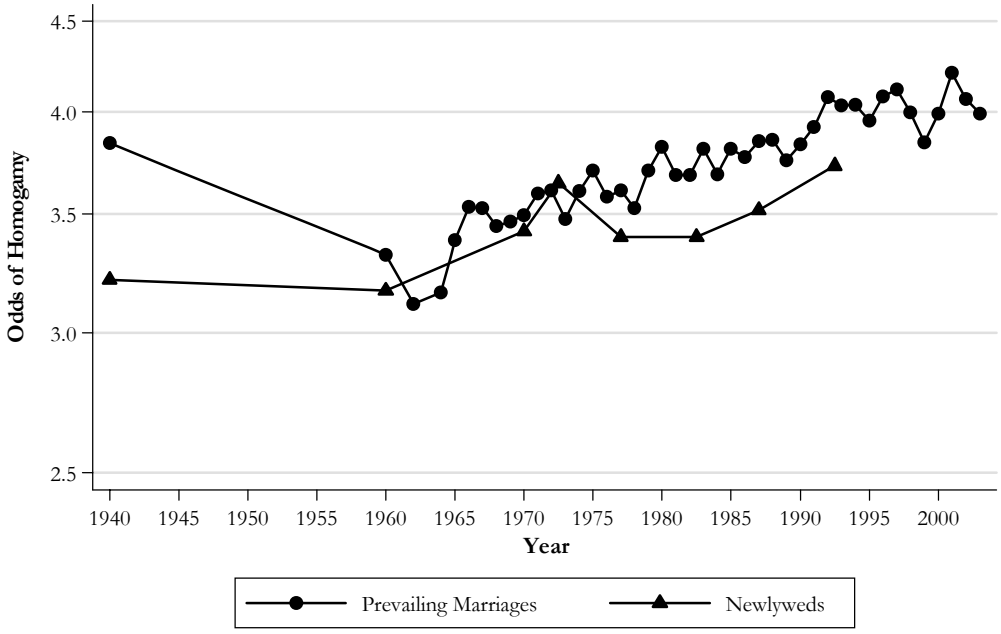
Panel B. Newlyweds



Notes: Results are weighted. Education categories are < 10, 10-11, 12 13-15, and ≥ 16 years of schooling. For newlyweds, available CPS years are grouped as follows: 1971-1974, 1975-1979, 1980-1984, 1985-1989, 1990-1995. They are graphed at their mid-point.

Sources: Current Population Survey (CPS) and U.S. Census data (IPUMS).

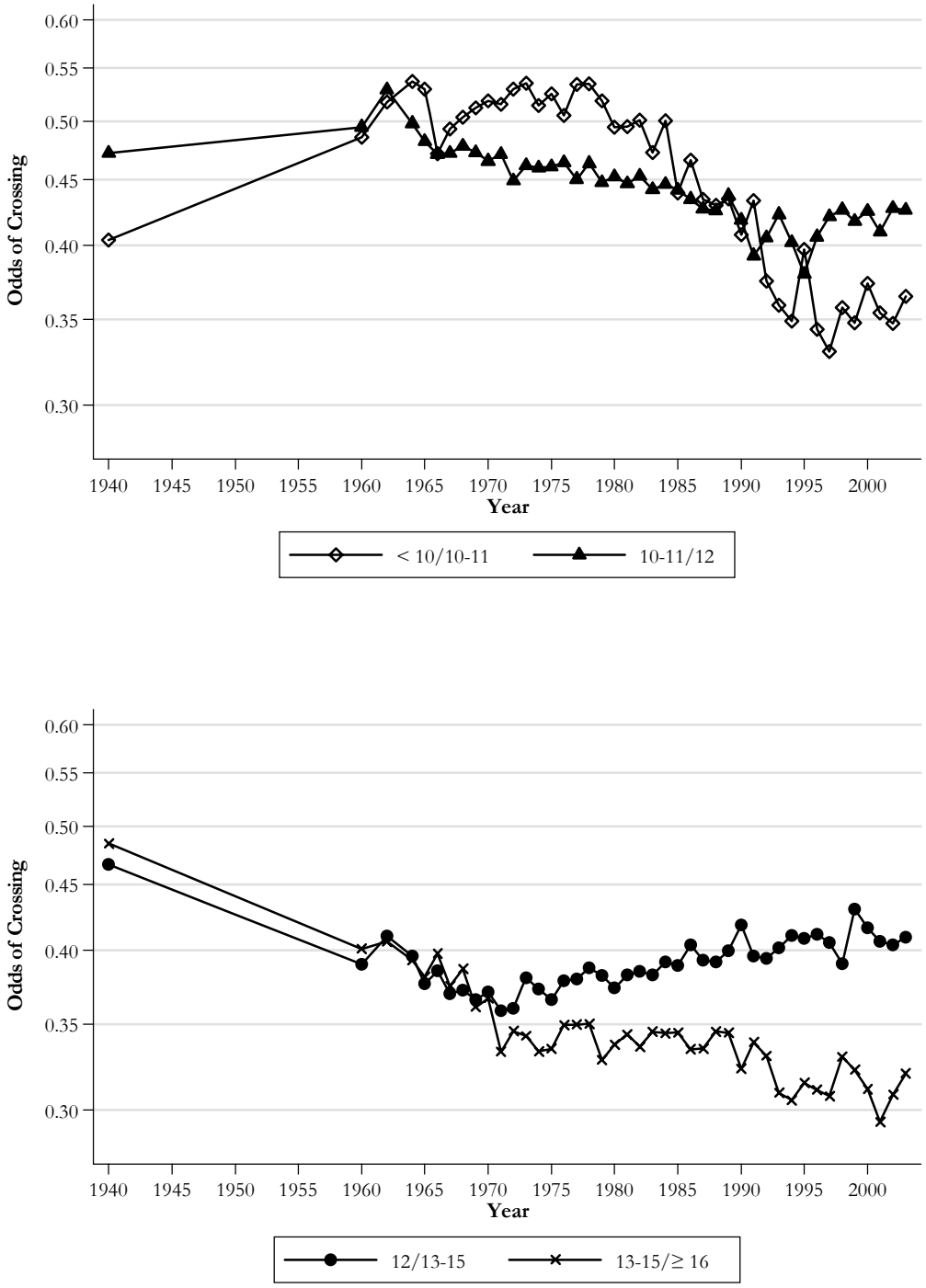
Figure 4. Odds of Homogamy by Sample (Wives 18-40): U.S., 1940-2003



Notes: Education categories are < 10, 10-11, 12, 13-15, and ≥ 16 years of schooling. For newlyweds, available CPS years are grouped as follows: 1971-1974, 1975-1979, 1980-1984, 1985-1989, 1990-1995. They are graphed at their mid-point.

Sources: Current Population Survey (CPS) and U.S. Census data (IPUMS).

Figure 5. Odds of Crossing an Educational Barrier Among Prevailing Marriages (Wives 18-40): U.S., 1940-2003



Sources: Current Population Survey (CPS) and U.S. Census data (IPUMS).

Appendix Table 1. Data Sources and Sample Selection

	Newlyweds[a]	CPS m-i-s[b]	Prevailing Marriages	CPS m-i-s[b]
(1) Census				
1940	1% General sample	N/a	1% General sample	N/a
1960	1% General sample	N/a	1% General sample	N/a
1970	1% Form 1 State sample	N/a	1% Form 1 State sample	N/a
1980	1% Metro (B Sample)	N/a	1% Metro (B Sample)	N/a
1990	N/a	N/a	1% Unweighted sample	N/a
2000	N/a	N/a	1% Census sample	N/a
Total N	49,552		1,268,283	
(2) Current Population Survey				
June supplement	1971	1-8	1971	1-3, 5-7
	1973	1-8	1973	5-7
	1974-1977	1-4, 5-8[c]	1974-1977	5-7
	1979	1-8		
	1980-1983	1-4, 5-8[c]		
	1985	1-8		
	1986-1988	1-4, 5-8[c]		
	1990	1-8		
	1992	1-8		
	1994	1-8		
	1995	1-8		
March supplement	N/a	N/a	1962	1-8
		N/a	1964-1978	5-8
October supplement	N/a	N/a	1968-1978	5-8
Merged Outgoing Rotation Groups file	N/a	N/a	1979-2003	8
Total N	24,352		730,673	

Notes: N/a = not applicable.

Sources: Integrated Public Use Microdata Series, Version 3.0 (Ruggles et al. 2004) (Census data); Unicon Research Corporation (June, March, and October CPS data); National Bureau of Economic Research (CPS Merged Outgoing Rotation Groups data).

[a]Newlyweds are defined following Mare (1991:18). Because of small sample sizes in the June CPS, newlyweds are defined as couples in which the wife married for the first time within 24 months of the interview. In the 1960-1980 Censuses, newlyweds are defined as couples in which the wife married for the first time within one year of the interview date. In the 1940 Census, newlyweds are defined as couples in which the wife was at most one year older at the interview date than at marriage.

[b]For the CPS, specific month-in-samples (m-i-s) were selected to eliminate the possibility of duplicate marriages in the data (see U.S. Census Bureau 2002 for details).

[c]All couples in m-i-s 1-4 were selected. Couples in m-i-s 5-8 who were married in the previous June were dropped to avoid duplicate observations.