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## Trends in Economic Homogamy: Changes in Assortative Mating or the Division of Labor in Marriage?

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### Abstract

The growing economic resemblance of spouses has contributed to rising inequality by increasing the number of couples in which there are two high- or two low-earning partners. The dominant explanation for this trend is increased assortative mating. Previous research has primarily relied on cross-sectional data and thus has been unable to disentangle changes in assortative mating from changes in the division of spouses' paid labor—a potentially key mechanism given the dramatic rise in wives' labor supply. We use data from the Panel Study of Income Dynamics (PSID) to decompose the increase in the correlation between spouses' earnings and its contribution to inequality between 1970 and 2013 into parts due to (a) changes in assortative mating, and (b) changes in the division of paid labor. Contrary to what has often been assumed, the rise of economic homogamy and its contribution to inequality is largely attributable to changes in the division of paid labor rather than changes in sorting on earnings or earnings potential. Our findings indicate that the rise of economic homogamy cannot be explained by hypotheses centered on meeting and matching opportunities, and they show where in this process inequality is generated and where it is not.

### Keywords

Economic homogamy; Assortative mating; Division of paid labor; Inequality; Life course

### Introduction

Abundant research has shown that changes in the family have contributed to the dramatic rise in income inequality in the United States since the late 1970s (see McCall and Percheski 2010; McLanahan and Percheski 2008 for reviews). Large increases in single-parent families and declining marriage rates mean that smaller fractions of people benefit from pooled incomes and economies of scale, thereby contributing to the growing gap between the rich and the poor. In addition, husbands' and wives' earnings have become more similar—that is,

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more economically *homogamous*. Growing economic homogamy has contributed to rising inequality by increasing the number of couples in which there are two high-earning or two low-earning partners. Previous studies have found that increasing earnings homogamy accounts for between 17 % and 51 % of the increase in inequality across married couple families in the United States (see Schwartz 2010 for a review). Thus, the well-off are now “doubly advantaged”: they are both more likely to be married and thus have access to a second paycheck, and because of increased economic homogamy, they are also more likely to be married to another high-earning spouse.

The dominant explanation for rising economic homogamy is increased assortative mating (e.g., Blossfeld and Timm 2003; Breen and Andersen 2012; Breen and Salazar 2010, 2011; Eika et al. 2014; Fernández and Rogerson 2001; Kremer 1997; Schwartz and Mare 2005). The idea is that couples are increasingly sorting on education or other socioeconomic characteristics in choosing their marriage partners and thus have more similar earnings, thereby increasing economic inequality across families and households. The growth of educational assortative mating and the rising correlation between spouses’ earnings is consistent with this interpretation (Cancian and Reed 1999; Pencavel 1998; Schwartz 2010; Schwartz and Mare 2005). Another possibility, however, is that increased economic homogamy has nothing to do with sorting. Instead, the rise may be the result of sweeping changes in the economic organization of families—that is, the shift in the division of paid labor from breadwinner/homemaker to dual-earner marriages (Ruggles 2015). In particular, the massive rise in wives’ and mothers’ labor force participation means that women are out of the labor market for less time than in the past, and thus their earnings may be more commensurate with men’s for a larger portion of their married lives. This increase in women’s earnings would increase economic homogamy among married couples even if there were no increase in sorting.

Research on the link between assortative mating and inequality has recognized the potentially important role of the division of paid labor for increased inequality, but this explanation has often been more of an afterthought than the focus of past work, which has centered on the role of assortative mating (e.g., Breen and Andersen 2012; Breen and Salazar 2011; Schwartz 2010). In addition, past studies have primarily relied on cross-sectional data and have been unable to disentangle the respective contributions of sorting and labor supply (e.g., Blackburn and Bloom 1995; Breen and Salazar 2011; Cancian and Reed 1999; Eika et al. 2014; Schwartz 2010; Western et al. 2008).

By contrast, a handful of recent studies have attempted to separate the effects of changes in assortative mating from the effects of changes in couples’ labor supply on rising inequality (Greenwood et al. 2014; Hryshko et al. 2014; Hyslop 2001; Pestel 2014). Similar to these studies, our main focus is the extent to which the rise in economic homogamy is due to assortative mating versus changes in the division of paid labor in marriage. Unlike prior research, though, we adopt a demographic perspective that emphasizes the importance of the life course and cohort succession as a mechanism for social change (Elder 1999; Ryder 1965). Other studies have collapsed variation across the life course and marriage cohorts in favor of cross-sectional period indicators of assortative mating and labor supply. Understanding how economic homogamy unfolds within and between cohorts, however,

offers clues about the potential mechanisms generating these changes in ways that period measures cannot. As Ryder powerfully argued, “The *raison d’être* of the longitudinal approach is the organization of personal data in temporal sequence, to determine the causal potentiality of otherwise isolated acts” (Ryder 1965:858–859). To our knowledge, our study is the first to show how economic homogamy evolves within and between cohorts, bringing descriptive evidence to bear on the various mechanisms of change. Thus, our study bridges the literature on assortative mating and inequality (e.g., Breen and Andersen 2012; Greenwood et al. 2014; Schwartz 2010) and studies of patterns of gender inequality and labor market participation across the life course (e.g., Goldin 2014; Percheski 2008). We supplement our longitudinal results with an analysis that is more conceptually similar to prior studies using period measures to check the robustness of our results to alternative methods.

Contrary to what has often been assumed, we show that the vast majority of the increase in economic homogamy is due to shifts in the division of paid labor in marriage rather than sorting on earnings or economic potential. We find that economic homogamy among newlyweds has not substantially increased and that the rise in economic homogamy is linked to changes in wives’ labor supply during marriage. This finding is relevant for empirical work on the link between family change and inequality because it suggests that the rise of economic homogamy cannot be explained by hypotheses centering on meeting and matching opportunities that may affect sorting into marriage. Rather, our results are more consistent with explanations for the rise of dual-earner marriages, such as increased job opportunities for women, the rising cost of childrearing, and declining fertility. In addition, our results suggest that previous studies have often focused on a part of the process where much less of the variation is generated. Unlike the previous focus on sorting, we show that the big change driving increased economic homogamy and its subsequent impact on inequality has been the massive shift in the division of paid labor in marriage.

## Explanations For Rising Economic Homogamy

### Increased Sorting on Earnings

Multiple processes may have led to increases in the economic resemblance of spouses over the past several decades. Given the rise of educational assortative mating (Schwartz and Mare 2005), many have argued that the correlation between spouses’ earnings should have increased in turn, either as a by-product of sorting on education (given that those with higher education tend to have higher earnings) or as a result of couples increasingly differentiating between potential spouses based on current earnings or earnings potential. Given the growing earnings gap between the college-educated and those with less education, men and women may be increasingly sorting on earnings because they have more to lose by “marrying down” (Fernández et al. 2005). Relatedly, growing residential segregation by income (Reardon and Bischoff 2011) may restrict opportunities to meet potential mates outside one’s income bracket and widen social differences between income groups, making intermarriage across economic strata less likely. The reduction of occupational segregation by gender may also have increased the opportunities for high-earning men to match with high-earning women (Blau et al. 2013). Apart from shifts in meeting and matching

opportunities, the growing symmetry of men's and women's preferences for mates with good financial prospects may partially drive increases in economic homogamy (Buss et al. 2001), and increased age at first marriage may facilitate sorting on observed earnings and earnings potential (Oppenheimer 1988). These mechanisms are not mutually exclusive, and all point to an increased sorting on earnings and earnings potential.

### **From Breadwinner-Homemaker to Dual-Earner Marriages**

Economic homogamy may also increase as a result of changes in spouses' division of breadwinning responsibilities in marriage. The steep rise of wives' and mothers' employment since the 1960s shifted the modal division of paid labor from breadwinner-homemaker to dual-earner marriages, thus transforming how spouses' economic resemblance evolves across the life course. This change began with older wives who rejoined the labor force after childrearing and continued with younger wives who increasingly remained employed after marriage and during their childbearing and childrearing years (Goldin 2006; Oppenheimer 1994).

Explanations for the rise of wives' and mothers' employment point to macroeconomic and demographic forces as key drivers of change. The rising demand for labor and increased job opportunities for women reduced the gender wage gap and raised the opportunity cost of staying home (e.g., Cotter et al. 2001; Mulligan and Rubinstein 2008). The deteriorating economic status of men and the rising costs of social reproduction (e.g., increasingly lengthy investments in children) increased the vulnerability of single-earner families to economic uncertainties relative to dual-earner families (Oppenheimer 1994). Fertility declines, in part facilitated by the advent of effective birth control technology (Bailey 2006; Goldin and Katz 2002), decreased the years spent rearing children and left more time for employment (Oppenheimer 1994). These changes have led many to observe that the specialization and trading model of marriage that characterized American families into the 1970s (Becker 1974) has shifted to one characterized by increased economic collaboration and flexibility about the breadwinner role (e.g., Cherlin 2004; Gerson 2010; Goldscheider et al. 2015; Oppenheimer 1997).

Given the rapid nature of change in the 1970s and 1980s, several scholars have argued that the rise of wives' labor force participation was largely unexpected. For instance, Goldin (2006) showed that in the 1970s, women in their late teens expected their labor force participation to resemble their mothers' and only upwardly revised their expectations as they married and grew older. Similarly, Gerson (1985) showed that women's working lives took unexpected turns in the 1970s and 1980s due to the rapid increase in labor market opportunities. Thus, changes in fertility, women's labor market opportunities, men's economic standing, and the costs of childrearing may have worked in concert to stimulate wives' economic contributions and to increase economic homogamy in ways that may not have been anticipated at the time of marriage.

### **Previous Literature: Sorting Versus Shifts in the Division of Paid Labor**

Although there are good reasons to expect that sorting on earnings or other characteristics associated with earnings have increased thereby contributing to growing inequality, the

empirical evidence connecting these trends is weak. For instance, there is a small but growing literature on the impact of educational assortative mating on earnings inequality. Some studies have found that increased educational homogamy has increased inequality in the United States (Fernández and Rogerson 2001; Greenwood et al. 2014), and others have found that it has not (Breen and Salazar 2010, 2011; Eika et al. 2014; Harmenberg 2014; Hryshko et al. 2014; Kremer 1997; Western et al. 2008). Breen and Salazar (2011) showed that a likely explanation for the null findings in the United States is the weak connection between increased educational homogamy and economic homogamy. The rise in economic homogamy, they argued, must be explained by sorting on characteristics other than education “and/or changes in the labor market-related decisions and behaviors of couples” (2010:833). Consistent with the interpretation that wives’ labor supply is a crucial determinant of the effects of assortative mating on inequality, Breen and Andersen (2012) found larger effects of educational assortative mating in Denmark, where a substantially higher percentage of wives work than in the United States. Thus, while the focus of much past work has been on sorting as a mechanism for increased inequality, results from previous studies suggest that changes in the division of paid labor are a key explanation for rising economic homogamy.

The pivotal role of wives’ labor supply is also implicated in other studies that have attempted to quantify the relative effects of assortative mating and changes in the division of paid labor on inequality. Greenwood et al. (2014) and Pestel (2014) found that the extent to which assortative mating affects inequality depends crucially on the extent to which wives work. Hyslop (2001) found smaller effects of couples’ labor supply than did other studies but included only continuously employed couples, thereby likely understating the impact of labor supply on inequality among all married couples. Hryshko et al. (2014) found very small effects of both assortative mating and labor supply on inequality but measured only the effects of *coordinated* labor supply decisions (e.g., an increase in wives’ employment with the loss of a husbands’ job). The total impact of wives’ increased labor force participation on inequality, which we examine here, may be much larger than the impact of their coordinated decisions.

A related and older literature addresses the overall impact of changes in wives’ labor supply on inequality. These studies concluded that increases in women’s employment were equalizing because of the reduction of variation in women’s earnings as more women entered the labor force, but that the rise of economic homogamy was disequalizing (Blackburn and Bloom 1995; Cancian et al. 1993; Cancian and Reed 1998, 1999). Nevertheless, because these studies relied on cross-sectional data, they could not disentangle the extent to which increases in economic homogamy were due to sorting versus changes in the division of paid labor.

Thus, although the emphasis of much recent work has been on sorting as a mechanism for inequality, results from previous literature suggest that wives’ labor supply may be a crucial but underappreciated component of trends in economic homogamy. We make this case more strongly than past research by showing where in the process inequality is generated and where it is not, and by using multiple measures of the contribution of changes in sorting and

the division of paid labor to the rise of economic homogamy—all of which point to the same conclusion.

## Analysis Plan

There are two dominant ways of conceptualizing assortative mating on earnings in the literature: (1) the degree of spouses' earnings resemblance before or at the time of marriage, and (2) the degree of resemblance on earnings potential. The gold standard for measuring the degree of sorting into marriage in the assortative mating literature has largely been the first—that is, the similarity of spouses' characteristics among newlyweds (Kalmijn 1998). Ideally, one would measure both spouses' characteristics *before* marriage to get closer to the characteristics couples actually sort on in the courtship process (Blossfeld 2009), but data on future spouses' characteristics are often absent from large-scale survey data unless the marriage is preceded by a cohabitation. However, it has long been recognized that couples sort not only on current characteristics but also on expected future characteristics (Oppenheimer 1988), and some studies have measured assortative mating as sorting on expected earnings or measures of permanent earnings rather than earnings at the time of marriage (e.g., Hryshko et al. 2014; Hyslop 2001; Sweeney and Cancian 2004).

In our first and main set of analyses, we approach the problem from a life course perspective, examining the changing evolution of economic homogamy both within and between marriage cohorts. In this analysis, we follow the assortative mating literature and define *sorting* as the degree of spousal resemblance in couples' first year of marriage and changes in the division of paid labor as shifts in economic homogamy that occur after the first year of marriage. This analysis provides the descriptive basis for testing hypotheses about the point in couples' lives in which inequalities are generated. We go on to estimate the extent to which the rise in inequality across married couples is due to increases in assortative mating versus changes occurring after the first year of marriage.

Because our interest is in the link between *observed* trends in economic homogamy and inequality, we do not control for various compositional shifts that could affect trends (e.g., changes in age at marriage or fertility). These shifts may be important mechanisms behind observed trends but will work through either changes in sorting or changes in the division of paid labor, which can be viewed as proximate determinants of economic homogamy. For instance, declining fertility may have increased wives' labor supply, and increases in age at marriage may have increased sorting. In supplementary analyses, we found that our results are robust to controls for these and other compositional shifts (see Online Resource 1). Our life course approach identifies the inequality generating points in the process, thus paving the way for future analyses on the more distal social and economic causes of these shifts.

In our second set of analyses, we take an approach more similar to past research to check the robustness of our results to alternative methods, collapsing across the life course and defining *sorting* as the correlation between spouses' full-time full-year (FTFY) earnings potential. In this analysis, we examine the extent to which couples are increasingly sorting on earnings. We also examine deviations from husbands' and wives' FTFY earnings



potential to assess whether changes in wives' deviations (consistent with a wives' labor supply explanation) drive the increase in the correlation between spouses' earnings.

Neither measure of sorting is without error. In the first analyses, sorting does not include sorting before marriage (although our results are robust to the inclusion of cohabitators) or sorting on expected future characteristics. In addition, the measure of the division of paid labor component does not isolate changes in labor supply, given that the correlation between spouses' earnings may be driven by either changes in labor supply or wages. Our second set of analyses separates the contribution of husbands' and wives' labor supply from changes in their earnings potential but is based on potentially incomplete models. Taken together, however, the results strongly point to the key role of wives' labor supply in the rise of economic homogamy and the relatively small contribution of sorting.

## Data, Measures, and Methods

### Data

Our primary data source is the 1968–2013 Panel of Income Dynamics (PSID), which is a longitudinal study of American households that began in 1968. All persons living in PSID families in 1968 were interviewed yearly through 1997 and every other year since. The PSID also follows anyone born into or adopted by a PSID family even after moving out of the original household. Those who married into PSID families were followed for as long as they lived with a member of the PSID sample. Our sample comprises married couples in the original cross-sectional sample in which the wife is 16–55 years of age, and their descendants (see Online Resource 1 for descriptive statistics). We restrict the sample to household heads and their spouses and exclude the Latino sample, the immigrant refresher sample, and the low-income oversample, so that changes in these samples do not affect our results. The results are robust to these exclusions (see Online Resource 1).

We also use the 1940–1980 U.S. decennial censuses (Ruggles et al. 2010), 1984–2013 Survey of Income and Program Participation (SIPP), and 1970–2013 March Current Population Survey (CPS) to supplement results from the PSID. To increase their comparability, we select wives aged 16–55 at the time of the survey across all data sources (PSID, U.S. census, SIPP, and CPS).

### Measures

We examine the association between married couples' prior calendar year's annual labor income (earnings) from 1970 to 2013. Beginning in 1997, the PSID moved from an annual to a biennial schedule, and most measures are available every other year since that time. Beginning in 2003, however, the PSID began collecting retrospective information about heads' and spouses' labor income for off-years (two calendar years prior to the interview), and we take advantage of these data in our analyses. Spouses' earnings are inflation adjusted to 2012 dollars using the consumer price index (CPI-U).

Because measures of inequality and homogamy may be sensitive to changes in the top-coding of earnings, we impose a consistent top-code across all our data sets equal to the maximum percentage of the husband/wife sample with top-coded earnings in the March

CPS in each year (Burkhauser et al. 2004). A maximum of 3 % of husbands had their earnings top-coded, whereas <1 % of wives' earnings were top-coded. Therefore, husbands' earnings above the 97th percentile are replaced with earnings for those at the 97th percentile in each year, and wives' earnings are not adjusted.

The changing association between spouses' earnings can be measured in many ways (Schwartz 2010). We use a summary measure of the association: the correlation coefficient. Other summary measures from log-linear models, such as uniform association and distance models, show trends similar to those we present here. A key advantage of the correlation coefficient is that a commonly used measure of inequality—the coefficient of variation (CV)—is decomposable into parts due to inequality among husbands, inequality among wives, and the correlation between spouses' earnings (e.g., Cancian et al. 1993). We take advantage of these qualities to estimate the impact of changes in economic homogamy on inequality.

## Methods

Our first set of analyses examines trends in economic homogamy from a life course perspective. To decompose change in the correlation between spouses' earnings between 1970 and 2013, we adapt classic methods for decomposing differences into parts due to differences in rates and differences in population composition (Kitagawa 1955). To begin, we are interested in the extent to which the change in the correlation between spouses' earnings from 1970 and 2013 is due to the change in two rates: (1) change in the correlation at the time of marriage (the sorting component), and (2) change that occurs after marriage (the division of paid labor component).

We formalize this as follows. In any given year, the cross-sectional correlation between spouses' earnings can be estimated as follows:

$$\tilde{r}_t = \sum_i r_{ti} w_{ti} \quad i = 1 - 30, \quad (1)$$

where  $r$  is the correlation between spouses' earnings,  $t$  is year,  $i$  is marital duration in years, and  $w$  is the proportion of marriages at duration  $i$  in year  $t$ . We follow marriage cohorts for 30 years ( $i = 30$ ) or until they are censored. Equation (1) produces an estimate of the correlation in year  $t$  rather than the observed correlation because, unlike the mean, a weighted average of correlation coefficients across groups does not equal the correlation coefficient estimated at the individual level. Nevertheless, sensitivity tests indicate that trends in the correlation coefficients from Eq. (1) are quite similar to those estimated from individual-level data.

To simulate what trends in the correlation would have been had assortative mating in the first year of marriage remained constant between 1970 and 2013 but changes that occur after marriage varied as observed, we fix the correlation between spouses' earnings for all newlyweds marrying after 1970 at their 1970 values and allow the correlation to evolve across subsequent marriage durations as observed. This can be written as follows:



$$r'_{ci} = r_{1970,1} + (r_{ci} - r_{c1}) \quad i = 1 - 30 \text{ and } (c > 1970, \text{ else } r'_{ci} = r_{ci}), \quad (2)$$

where  $c$  is marriage cohort (year of marriage), and  $r'_{ci}$  is the counterfactual correlation for marriage cohort  $c$  at marital duration  $i$ . Thus, in every year, couples in their first year of marriage have the correlations from 1970; in each subsequent year, the correlation moves up or down depending on the observed change between marital duration  $i$  and couples in their first year of marriage in cohort  $c$ . This method holds the newlywed values constant at 1970 but allows the trajectories of the correlations by marriage cohort to vary as observed.

In the second simulation, we estimate the trend in the correlation under the counterfactual that all marriage cohorts after 1970 had the same correlation as those marrying in 1970 for all marital durations, or

$$r''_{ci} = r_{1970,i} \quad i = 1 - 30 \text{ and } (c > 1970, \text{ else } r''_{ci} = r_{ci}). \quad (3)$$

Thus, marriages formed after 1970 all have the newlywed correlations and trajectories of those marrying in 1970.

The simulation in Eq. (3) allows marriages formed prior to 1970 to vary as observed. Thus, in our third simulation, we further apply the 1970 correlations to all marriages formed from 1940–2013:

$$r'''_{ci} = r_{1970,i} \quad i = 1 - 30 \text{ and } c \geq 1940. \quad (4)$$

The drawback to Eq. (4) is that it does not separate changes due to assortative mating from those due to the division of paid labor among marriages formed prior to 1970. This problem arises because the PSID is prospective, and we do not have earnings information back to the 1940s; we have earnings information beginning only in 1968, when the survey was first administered. Thus, we supplement our analysis using the 1940, 1960, 1970, and 1980 U.S. decennial censuses for the earlier marriage cohorts.<sup>1</sup> We do not use the later censuses because date of first marriage information was not collected after 1980, and thus marital duration cannot be calculated. The analysis procedure using the census is exactly the same as described for the PSID but with two modifications: (1) we linearly interpolate the correlation between census years by cohort and marriage duration; and (2) because the census is not longitudinal, trajectories comprise different couples at different marital durations. Because the census and PSID are quite different, we do not pool the two data sources but instead perform a separate decomposition of changes in earnings homogamy between 1970 and 1980, using the census data to estimate how much change between 1970

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<sup>1</sup>We do not use the 1950 census because only one person in the household was asked about their earnings, and thus spouses' earnings correlations cannot be calculated.

and 1980 in the PSID is due to changes in sorting versus changes in the division of paid labor. See Online Resource 1 for details on the census analysis.

Equations (2)–(4) are written in terms of changes in earnings correlations by marital duration within marriage cohorts, but we are ultimately interested in how cohort and duration shifts in these processes explain period trends in economic homogamy. Because year of marriage plus marital duration equals year ( $c + i = t$ ), we can use Eqs. (2)–(4) to estimate the simulated cross-sectional period correlations under the various counterfactuals. For instance, the counterfactual period trend in which the correlation for newlyweds from 1970–2013 remains fixed at its 1970 values is as follows:

$$r'_t = \sum_i r'_{ti} w_{ti}. \quad (5)$$

Equation (5) shows that changes in the distribution of marital durations ( $w_{ti}$ ) also affect period measures of the correlation between spouses' earnings. Therefore, to fully decompose trends, one also needs to account for the shifting distribution of marital durations in the population. Equations similar to Eq. (5) are used to estimate period trends for the other counterfactuals. These are summarized in Table 3 in the appendix.

Our second set of analyses estimates sorting on FTFY earnings potential, using a method similar to that described in Xie et al. (2003). We use data from the 1970–2000 U.S. census and the 2001–2013 American Community Survey (ACS) on FTFY workers (defined as those working more than 34 hours per week for at least 50 weeks per year) to predict annual earnings by sex and survey year as a function of age, age squared, education, three-digit occupation, race, and parental status. Earnings potential estimated from the census/ACS is then merged with the PSID, thereby assigning earnings potential for the full sample, including those who work part-time or have zero annual earnings. Thus, spouses' earnings potential in each year of marriage is measured as predicted FTFY earnings based on individuals' characteristics in that year.<sup>2</sup> Online Resource 1 gives further details on the estimation and fit statistics of these models.

## Results

### Trends in Earnings Homogamy

Figure 1 shows trends in the correlation between spouses' earnings from 1940 to 2013 for newlyweds and prevailing marriages using the PSID, SIPP, U.S. decennial census, and March CPS. For ease of presentation, data from the PSID, SIPP, and CPS are grouped in five-year intervals. As shown in previous research using the March CPS (Reed and Cancian 2012; Schwartz 2010), Fig. 1 demonstrates that the correlation between spouses' earnings among prevailing marriages rose quickly from 1970 through about 1990 but has increased

<sup>2</sup>Defining sorting as the association between spouses' FTFY earnings potential as predicted by characteristics in a given year assumes perfect foresight of changes that affect future earnings, such as changes in occupation or educational attainment. To the extent that individuals do not foresee these changes, we will overestimate the contribution of sorting on earnings potential. Sensitivity tests show that estimating predicted earnings based only on characteristics at the time of marriage yields results very similar to those presented here.

little since then. Figure 1 also shows trends among newlyweds. The correlation for newlyweds estimated from the PSID is consistently higher than from the census and the SIPP (most likely because of differences in when earnings is measured relative to the date of marriage across the sources), but the lack of a strong trend is similar across sources. The level difference for newlyweds is not an issue for our analyses because the decomposition relies on change in the correlation rather than on absolute levels.

There are two main lessons to draw from trends among newlyweds. First, the correlations for newlyweds are much higher than for prevailing marriages. This pattern is consistent with declines in women's labor force participation after marriage. Second, and more importantly, we do not observe the steep and sustained increase that we would expect given the increase in educational homogamy since the 1960s reported by Schwartz and Mare (2005). There are hints of an increase in the correlation for newlyweds in the 1970s and 1980s, but overall, what is most notable for newlyweds is the relative lack of change. This is a first indication that assortative mating (at least as measured as characteristics at the time of marriage) is most likely not responsible for the bulk of the increase in earnings homogamy among prevailing marriages.

To put these findings in context, Fig. 2 shows trends in husbands' and wives' labor force participation from 1970 to 2013 using PSID data. Panel a of Fig. 2 shows that trends in wives' labor force participation (nonzero annual earnings in the past year) mirror trends in the correlation between spouses' earnings among prevailing marriages. Both trends show a rise from 1970 to about 1990 and relative stability since then. Panel a also shows that perhaps it is not surprising that correlations for newlyweds changed less, given that newlywed wives were already working at relatively high levels in the 1970s and changed their labor force participation to a much lesser extent than all wives. Panel b shows that husbands in newly formed and prevailing marriages work less than they once did, but by far the largest change in labor force participation is the well-known rise in wives' market work.

Figure 1 shows trends among newlyweds and prevailing marriages, but what about trends at other marital durations? Fig. 3 answers this question by showing trends in life course patterns of spouses' earnings correlations. For marriages beginning in the 1970s and after, the first data point for each cohort is the correlation among newlyweds (e.g., the first year of marriage for those married in the 1970s), followed by the correlation for up to 30 years of marriage. Cohort trends for those married in the 1950s and 1960s begin in couples' 20th and 10th years of marriage, respectively. The lines represent lowess smoothed trends based on earnings correlations for single years of marriage. The main finding is that later cohorts maintain higher spousal earnings correlations for more of their married lives than earlier cohorts. For all marriage cohorts, the correlation between spouses' earnings declines initially. For couples married in the 1970s, the decline lasted approximately 20 years, whereas for those married in the 1980s, the decline lasted approximately 15 years. The compression of the U-shaped trends continued among couples married in the 1990s. For this cohort, the downward trajectory lasted for approximately 10 years, rebounding faster than either of the previous two cohorts. There is some evidence of a reversal in the downward trajectory after approximately 10 years of marriage for the 2000 cohort, but data on future years are necessary to confirm this. Figure 3 also shows large increases in earnings

homogamy among cohorts married in the 1950s and 1960s well into their married lives. Overall, the patterns in later cohorts are consistent with shorter spells out of the labor market, declining fertility, and a shift from breadwinner-homemaker to dual-earner marriages. Moreover, sensitivity tests show that observed trends are robust to changes in the distribution of wives' age among newlyweds and prevailing marriages, wives' education, number of children, and to the inclusion of cohabiting unions (see Online Resource 1 for details).

Although our explanation has rested thus far on a shift in the division of paid labor, it is possible that increases in the correlation between spouses' earnings are not due to shifts in the *hours* that spouses work but rather to an increase in the correlation between their *wages* given the contemporaneous shrinking of the gender wage gap. Figure 4 shows that this is not the case; the correlation between spouses' wages did not substantially increase over this period. Instead of being driven by wages, the correlation between spouses' earnings almost perfectly reflects the increasing correlation between spouses' hours—a trend consistent with the shift in the division of paid labor in marriage. We return to the contribution of changes in spouses' labor supply in the second part of our analysis, which allows us to more directly examine the separate contributions of shifts in husbands' versus wives' labor supply.

### Change Among Newlyweds Versus After the First Year of Marriage

To quantify the extent to which changes among newlyweds versus changes that occur after the first year of marriage account for observed increases in the correlation between spouses' earnings, we estimate a series of counterfactual trends using the methods described earlier. To estimate the contribution of changes among newlyweds married in 1970 and after, we hold the correlation among newlyweds constant at its 1970s values for all subsequent marriage cohorts but allow all else to change as observed. As Fig. 5 shows, this counterfactual trend is very similar to the observed trend, which is consistent with the small increase in newlyweds' correlations between 1970 and 2013 shown in Fig. 1. Panel a of Table 1 shows that changes in the correlation between newlyweds' earnings explain only 11 % of the increase in economic homogamy between 1970 and 2013.

The second counterfactual holds the correlation between newlyweds' earnings constant at their 1970 values for all subsequent marriage cohorts and additionally holds the trajectories of spouses' earnings correlations constant at their 1970 values for all subsequent marriage cohorts. Differencing these two counterfactuals gives us an estimate of the portion of change due to changes that occur after the first year of marriage. Figure 5 and Table 1 show that changes in the correlation between spouses' earnings after the first year of marriage explain somewhat more of the overall increase (17 %). Thus, from these simulations, shifts in sorting on earnings as measured in couples' first year of marriage and shifts that occur after the first year of marriage both play relatively small roles in explaining the overall rise, although shifts that occur after marriage play a somewhat larger role.

What explains the remainder of the increase in the correlation between spouses' earnings? One factor that has not yet been accounted for is changes among couples married *before* 1970. As mentioned earlier, because we lack earnings information for cohorts married before the start of the PSID, we cannot decompose these early changes into parts due to

changes among newlyweds and changes later in marriage. Thus, to estimate the portion of the trend due to changes in the correlation between spouses' earnings among cohorts married prior to 1970, we set the correlation at all marital durations for couples married between 1940 and 2013 to their 1970 values. Figure 5 shows that changes among couples married before 1970 explain a large portion of the increase, especially in the early 1970s, and 64 % of the overall rise (Table 1). Changes in the distribution of marital durations in the sample explain 9 % of the rise.

Because such a large proportion of the increasing correlation is due to changes among earlier marriages, we turn to supplemental data from the census to further decompose this portion of the trend. We follow the same procedure described earlier to decompose the portion of the 1970–1980 prevailing marriage census trend (shown in Fig. 1) into parts due to changes among couples in their first year of marriage from 1940–1980 and changes that occur after the first year of marriage for these cohorts (see Online Resource 1 for further details). Panel b of Table 1 shows that 100 % of the increase between 1970 and 1980 in the census is due to changes that occur after the first year of marriage. Changes among newlyweds explain 2 % of the increase, whereas changes in the distribution of marital durations slightly dampened increases in the correlation.

Thus, the census results suggest that the portion of the rise we were previously unable to decompose (64 %) is likely to be virtually entirely due to changes that occur after the first year of marriage. As shown in panel c of Table 1, the census and PSID results together imply that only 12 % of the rise in economic homogamy between 1970 and 2013 is attributable to changes among newlyweds, 80 % is due to changes in how the correlations evolve during marriage, and the remainder is due to shifts in the distribution of marital duration. This is compelling evidence that changes among newlyweds are a very small portion of the rising correlation between spouses' earnings and that shifts in what happens after marriage is the main engine of change.

What do these results imply for inequality among married couples? We use the simulations described earlier to estimate counterfactual trends in inequality using the CV, following the method outlined in Cancian et al. (1993) (see also Online Resource 1 for details). Table 2 shows results for the decomposition of change in the CV using PSID and census data. We estimate that 16 % of increased inequality among married couples between 1970 and 2013 is due to increased economic homogamy (panel c). However, the contribution between 1970 and 2005 is 22 % (not shown)— an estimate similar to that found in previous research over the same period (Schwartz 2010).<sup>3</sup> Changes among newlyweds account for 16 % of the total impact of the correlation between spouses' earnings on inequality, whereas 78 % is due to changes in how correlations evolve after the first year of marriage. Thus, shifts in the division of paid labor, measured as changes in the evolution of spouses' earnings correlations after the first year of marriage, are the driving force behind the impact of economic homogamy on earnings inequality among married couples.

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<sup>3</sup>Because the correlation between spouses' earnings has been stable since approximately 1990 but inequality has risen, estimates of the contribution of economic homogamy to inequality are larger in earlier periods.

## Sorting on Earnings Potential

Our analyses thus far have shown that spouses do not appear to be sorting more on earnings at the time of marriage, but are they sorting more on earnings potential? To address this question, we turn to our second set of analyses, which examines trends in economic homogamy on earnings potential using predicted FTFY earnings from the census and ACS.

Figure 6 shows that the correlation between spouses' FTFY earnings potential (trend line 1) has not increased. In fact, the correlation between spouses' earnings potential was essentially flat across the period.<sup>4</sup> Thus, the increasing correlation between spouses' earnings cannot be explained by increased sorting on couples' earnings potential. Rather, Fig. 6 shows that the increase in observed economic homogamy (trend line 2) mirrors the correlation between husbands' and wives' *deviations* from predicted FTFY earnings. Spouses may deviate from their expected FTFY earnings because they are working less than FTFY (a labor supply explanation) and/or because other characteristics that predict earnings are not included in our model. For instance, couples may be using characteristics such as ability, motivation, or college prestige to extrapolate their spouses' earnings potential. Increased sorting on these and other unmeasured characteristics would increase the correlation between husbands' and wives' deviations from predicted FTFY earnings. This interpretation is possible, but our finding that increases in the correlation between spouses' hours closely mirror the rising correlation in spouses' earnings (Fig. 4) suggests that increases in wives' labor force participation is a more likely explanation.

To further investigate whether increases in earnings homogamy are driven by husbands' or wives' deviations from predicted FTFY earnings, we plot the correlation between husbands' observed annual earnings and wives' FTFY earnings potential and between husbands' FTFY earnings potential and wives' observed annual earnings. In conjunction with other trends in Fig. 6, the results show that changes in wives' deviations from predicted FTFY earnings are responsible for the increasing correlation between spouses' observed earnings. All trends that contain shifts in wives' labor supply (Fig. 6, trend lines 2, 3, and 5) show an increase in economic homogamy, whereas when wives' labor supply is held constant the correlations decline or are flat (trend lines 1 and 4). In short, our results are not explained by increased sorting on earnings potential but rather are driven by wives' deviations from FTFY earnings potential. As in the first set of analyses, these results point to wives' labor supply as a crucial factor for increases in economic homogamy.

## Discussion

Our study challenges prior research that has primarily conceptualized the rise in economic homogamy as a function of increased assortative mating (e.g. Blossfeld and Timm 2003;

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<sup>4</sup>Supplementary analyses suggest that the correlation between spouses' earnings potential did not increase because the correlation between spouses' years of schooling declined over this period in the PSID. The declining correlation between spouses' years of schooling is inconsistent with many assortative mating studies, which have reported an increase in educational homogamy (see Schwartz 2013 for a review). However, the correlation coefficient is affected by changes in the marginal distributions of spouses' education. Log-linear models controlling for shifts in the marginal distributions of education using the PSID produce increases in educational homogamy similar to those estimated by Schwartz and Mare (2005). It is debatable whether the best way to measure the effects of educational assortative mating on earnings homogamy and inequality is to control for the marginal distributions (Breen and Salazar 2011). However, resolving this issue is beyond the scope of this article.



Breen and Andersen 2012; Breen and Salazar 2010, 2011; Eika et al. 2014; Fernández and Rogerson 2001; Kremer 1997; Schwartz and Mare 2005). We find that the vast majority of the increase in the correlation between spouses' earnings between 1970 and 2013 was due to shifts in the division of paid labor in marriage rather than increased sorting on earnings at the time of marriage or on earnings potential. Newlywed couples' earnings are not more similar today than they were in the past; instead, spouses' earnings have become more similar within marriage as wives' labor supply increased. Shifts in the division of paid labor also drive the inequality producing effect of economic homogamy. We estimate that only 16 % of the total contribution of economic homogamy to increases in earnings inequality among married couples is attributable to increased sorting. Our findings are consistent with prior work emphasizing the importance of women's labor force participation for whether educational assortative mating translates into increased income inequality (Breen and Andersen 2012; Greenwood et al. 2014), but we also emphasize how changes in the division of paid labor impact economic homogamy even *without* changes in sorting.

Our life course approach sheds light on the potential mechanisms behind the rise in economic homogamy. Changes in meeting and matching opportunities suggest an increase in economic homogamy at the time of marriage. Residential income segregation grew (Reardon and Bischoff 2011), and occupational sex segregation declined (Blau et al. 2013), both of which should increase the odds of marrying someone of a similar income group. Our results, however, did not show the expected increase in earnings similarity among newlyweds. This suggests either that the changes in the structure of search were not large enough to affect sorting on earnings or that they did not substantially affect the matching process. Perhaps earnings among newlyweds and young people more generally have become "noisier" as the transition to adulthood has lengthened and earnings volatility has increased (Dynan et al. 2012; Oppenheimer et al. 1997).

Similarly, we did not find evidence of increased sorting on partners' earnings potential. Sorting on earnings potential was essentially flat from 1970 to 2013 (see also Kremer 1997), suggesting that (1) individuals are not more likely to sort on their spouses' earnings potential today than they were in the 1970s, (2) spouses are using other measures to predict earnings potential that were not included in our models, or (3) earnings potential may not have been easily predictable for much of the period we examine. This latter conjecture is consistent with the argument that changes in women's future labor force participation in the 1970s and 1980s were largely unanticipated (Gerson 1985; Goldin 2006). Despite the quieting of markers of gender equality (England 2010), sorting on earnings potential has not increased in recent years. This finding could indicate that the challenges of work-family balance and income volatility perpetuate uncertainty and limit young men's and women's capacity to anticipate earnings (Blair-Loy 2003; Stone 2007).

Future research should investigate the social and economic mechanisms that underlie our findings. We find that sorting is a relatively small component of changing economic homogamy, while changes in the division of paid labor play a much larger role. But why is this the case? Why have changes in sorting on earnings or earnings potential been smaller than expected given changes in meeting and matching opportunities that point to increased homogamy? What are the primary reasons behind shifting patterns of economic resemblance

across the life course? In particular, how have changes in the relationship between childrearing and wives' labor supply affected these patterns? Our sensitivity analyses indicate that compositional shifts in numbers of children born are not responsible for the shifts we observe, but perhaps changes in the *effects* of childrearing and childbearing on women's labor force participation are important determinants of change (Musick et al. 2016). Other social and economic shifts may have also contributed to these patterns, such as the rising costs of housing and childrearing as well as the stagnation of men's median earnings. The results from this study set the stage for analyses of these issues. Our contribution has been to show how economic homogamy evolves across the life course and to identify where inequality is generated and where it is not. We find that sorting—the part of the process that has been the focus of most prior work—has had a very small impact on trends in economic homogamy and its contribution to inequality relative to the much larger impact of the shift toward dual-earner marriages.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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## Appendix

**Table 3**

Summary of simulations for decomposition of trends in the correlation between husbands' and wives' earnings among prevailing marriages

| Trend or Simulation   | By Cohort and Marital Duration              | By Year  |
|---|---|--|
| (1) Observed  | n/a   | $\tilde{r}_t = \sum_i r_{ti} w_{ti}$   |
| (2) Correlation for Newlyweds<br>–From 1970–2013 Fixed<br>–at 1970 Values   | $r'_{ci} = r_{1970, i} + (r_{ci} - r_{c1})$ | where $i = 1$ to 30<br>and ( $c > 1970$ ,<br>else $r'_{ci} = r_{ci}$ )<br>$r'_t = \sum_i r'_{ti} w_{ti}$   |
| (3) Correlation at All Marital<br>–Durations from 1970–2013<br>–Fixed at 1970 Values  | $r''_{ci} = r_{1970, i}$                    | where $i = 1$ to 30<br>and ( $c > 1970$ ,<br>else $r'_{ci} = r_{ci}$ )<br>$r''_t = \sum_i r''_{ti} w_{ti}$ |
| (4) Correlation at All Marital<br>–Durations From 1940–2013<br>–Fixed at 1970 Values  | $r'''_{ci} = r_{1970, i}$                   | where $i = 1$ to<br>30 and $c = 1940$<br>$r'''_t = \sum_i r'''_{ti} w_{ti}$                                |
| (5) Correlation at All Marital<br>–Durations from 1940–2013<br>–Fixed at 1970 Values and<br>–Constant Marital Duration<br>–Distribution | n/a   | $r'^v_t = \sum_i r'''_{ti} w_{1970i}$  |

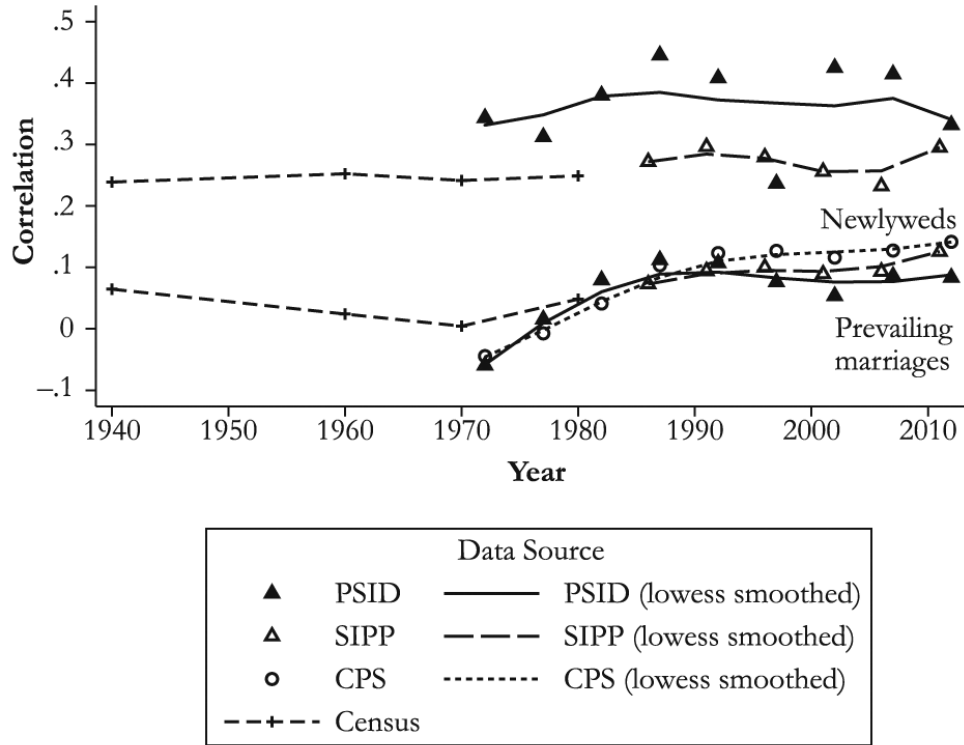
Note: See the text for notation.

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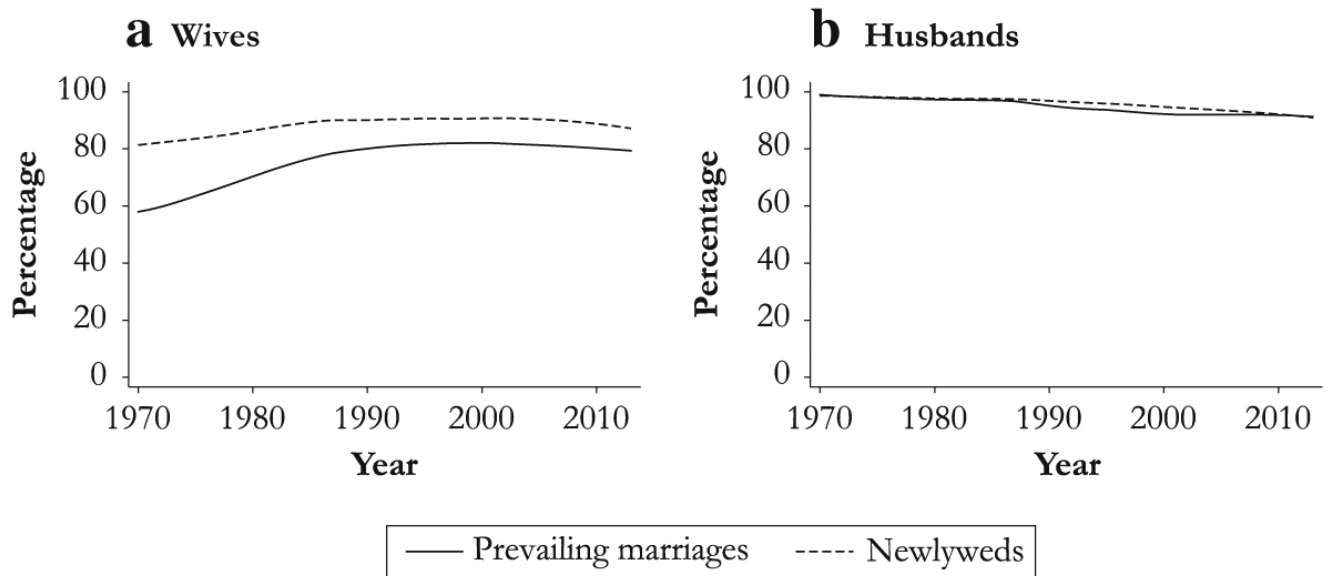
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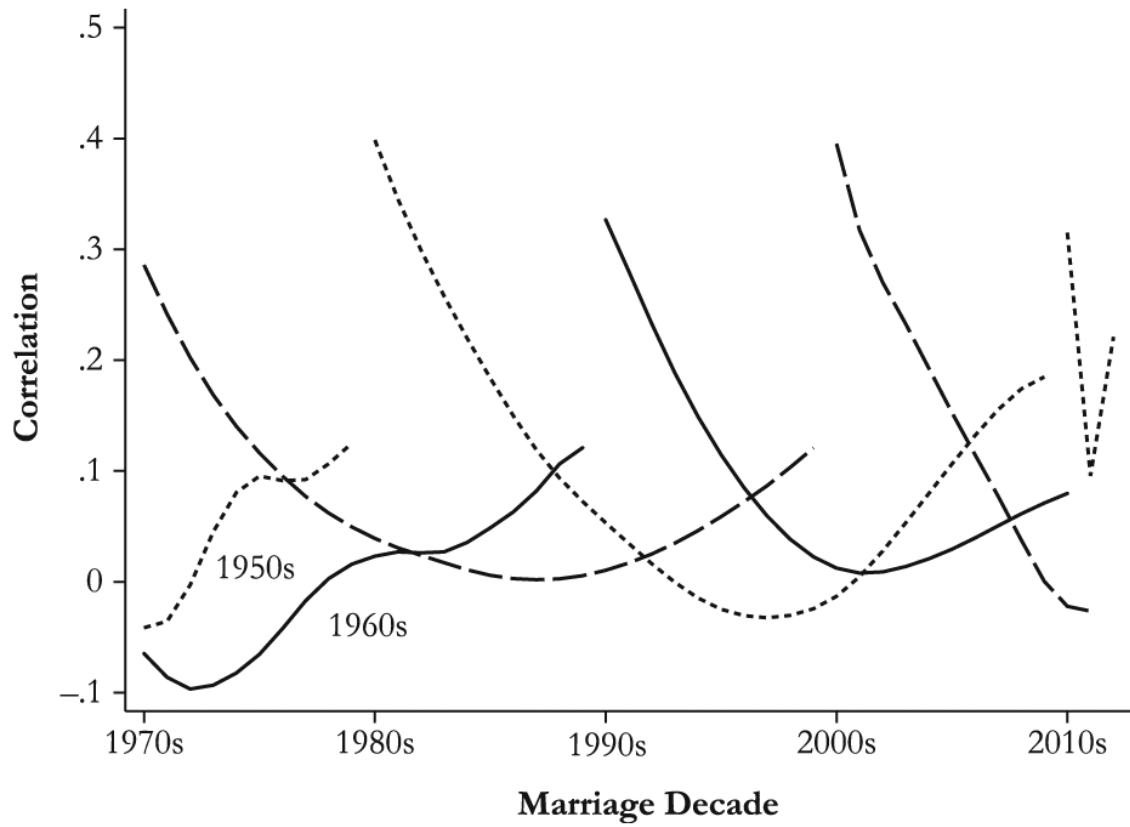


**Fig. 1.** Trends in the correlation between husbands’ and wives’ earnings for newlyweds and prevailing marriages by data source, 1940–2013. Correlations are computed for five-year intervals in the PSID and CPS (1970–1974,... 2005–2009, 2010–2013) and for the SIPP (1984–1988,... 2009–2013) and are graphed at their midpoints. Trend lines for the PSID, SIPP, and CPS are lowess smoothed. *Sources:* 1970–2013 Panel Study of Income Dynamics (PSID), 1984–2013 Survey of Income and Program Participation (SIPP); 1940, 1960, 1970, and 1980 U.S. decennial censuses; and 1970–2013 March Current Population Survey (CPS)

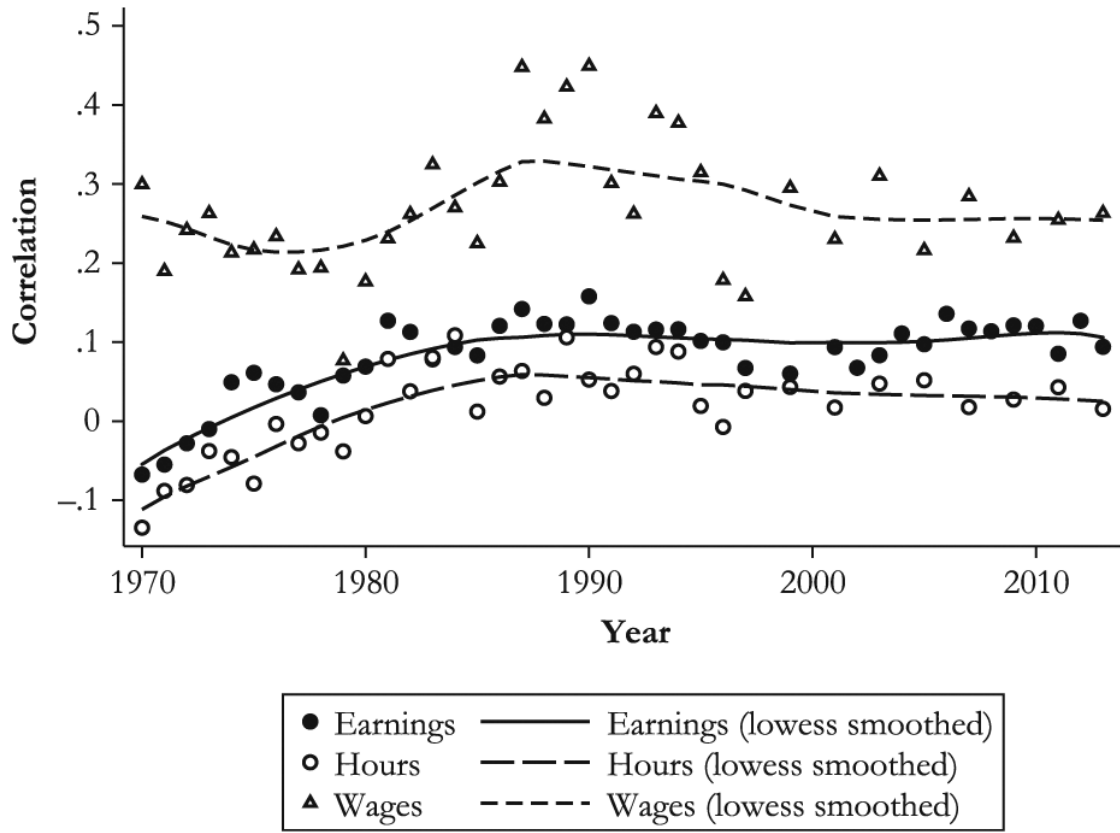




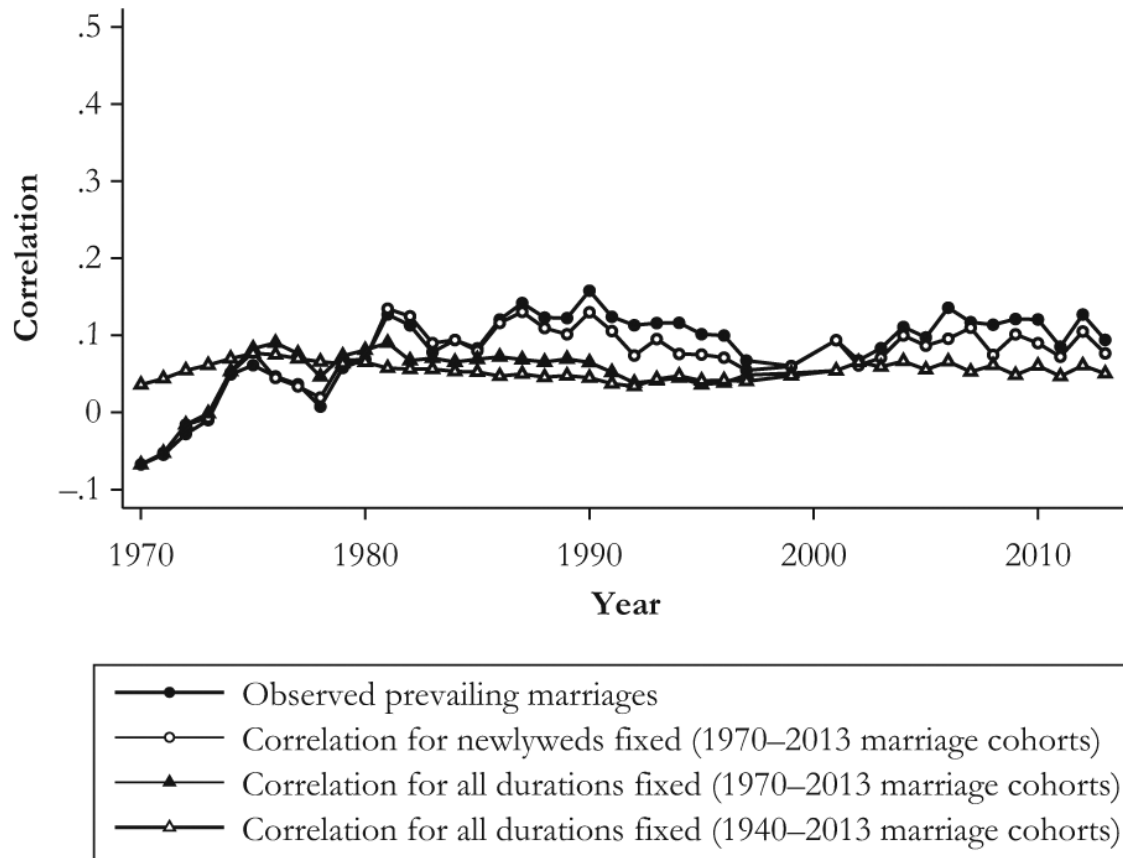
**Fig. 2.** Trends in husbands' and wives' labor force participation for newlyweds and prevailing marriages, 1970–2013. Trend lines are loess smoothed. Labor force participation is defined as reporting nonzero annual earnings in the past year. *Source:* 1970–2013 Panel Study of Income Dynamics (PSID)



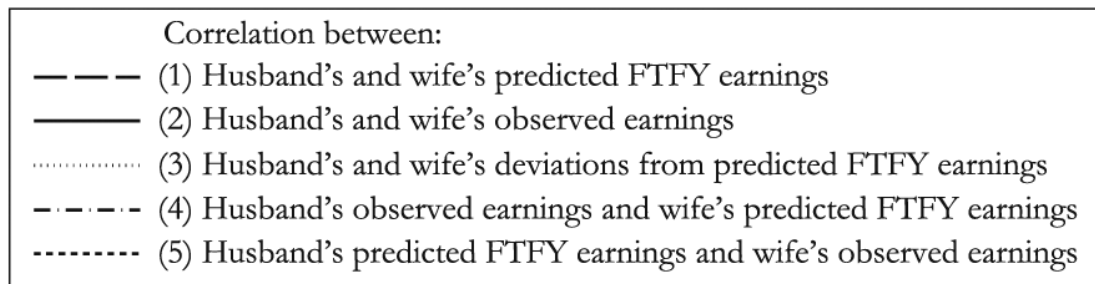
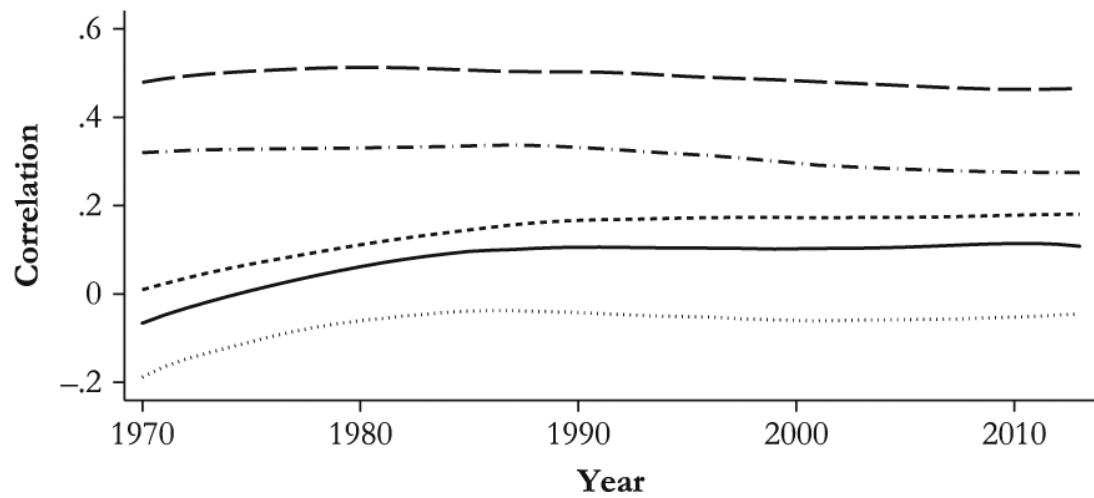
**Fig. 3.** Trends in the correlation between husbands' and wives' earnings by marriage decade and marital duration, 1970–2013. Trend lines are loess smoothed. Marriage decade-marital duration cells with sample sizes of less than 100 are omitted. *Source:* 1970–2013 Panel Study of Income Dynamics (PSID)



**Fig. 4.** Trends in the correlation between husbands' and wives' earnings, wages, and hours, 1970–2013. Trend lines are lowess smoothed. Trends in the correlation between husbands' and wives' wages exclude couples in which wages are missing (either partner had zero annual earnings). *Source:* 1970–2013 Panel Study of Income Dynamics (PSID)



**Fig. 5.** Observed and simulated trends in the correlation between husbands' and wives' earnings among prevailing marriages, 1970–2013. *Source:* 1970–2013 Panel Study of Income Dynamics (PSID)



**Fig. 6.**

Trends in the correlation between husbands' and wives' earnings: Observed, predicted, and deviations from predicted, 1970–2013. FTFY = full-time/full-year. *Sources:* 1970–2013 Panel Study of Income Dynamics (PSID), 1970–2000 U.S. decennial censuses, and 2001–2013 American Community Survey

**Table 1**

Decomposition of trends in the correlation between husbands' and wives' earnings among prevailing marriages

| <b>Decomposition and Data Source</b>   | <b>Change</b> | <b>% Contribution</b> |
|--|---------------|-----------------------|
| a. Decomposition of Observed Change From 1970–2013 (PSID data) Due to:                     |               |                       |
| Change among newlyweds married 1970–2013   | .0175         | 10.8                  |
| Change after first year of marriage for those married 1970–2013                            | .0269         | 16.6                  |
| Change among those married 1940–1969   | .1026         | 63.5                  |
| Changing marital duration distributions  | .0147         | 9.1                   |
| Total  | .1617         | 100.0                 |
| b. Decomposition of Observed Change From 1970–1980 (census data) Due to:                   |               |                       |
| Change among newlyweds married 1940–1980   | .0008         | 1.8                   |
| Change after first year of marriage for those married 1940–1980                            | .0439         | 100.0                 |
| Changing marital duration distributions  | –.0008        | –1.8                  |
| Total  | .0439         | 100.0                 |
| c. Combined Decomposition of Observed Change From 1970–2013 (PSID and census data) Due to: |               |                       |
| Change among newlyweds married 1940–2013   | .0193         | 11.9                  |
| Change after first year of marriage for those married 1940–2013                            | .1294         | 80.1                  |
| Changing marital duration distributions  | .0129         | 8.0                   |
| Total  | .1617         | 100.0                 |

*Sources:* 1970–2013 Panel Study of Income Dynamics (PSID) and 1940, 1960, 1970, and 1980 U.S. decennial censuses.



**Table 2**

Contribution of trends in the correlation between husbands' and wives' earnings to trends in inequality (coefficient of variation)

| <b>Decomposition and Data Source</b>   | <b>Change</b> | <b>% Contribution to Change in CV</b> | <b>% Contribution of Component</b> |
|--|---------------|---------------------------------------|------------------------------------|
| a. Decomposition of Observed Change in CV From 1970–2013 (PSID data) Due to:                     |               |                                       |                                    |
| Change among newlyweds married 1970–2013   | .0056         | 2.5                                   | 14.9                               |
| Change after first year of marriage for those married 1970–2013                                  | .0087         | 3.9                                   | 23.2                               |
| Change among those married 1940–1969   | .0205         | 9.2                                   | 54.8                               |
| Changing marital duration distributions  | .0027         | 1.2                                   | 7.1                                |
| Total  | .0374         | 16.7                                  | 100.0                              |
| b. Decomposition of Observed Change in CV from 1970–1980 (census data) Due to:                   |               |                                       |                                    |
| Change among newlyweds married 1940–1980   | .0003         | 0.9                                   | 2.5                                |
| Change after first year of marriage for those married 1940–1980                                  | .0103         | 34.8                                  | 99.7                               |
| Changing marital duration distributions  | –.0002        | –0.8                                  | –2.3                               |
| Total  | .0085         | 34.9                                  | 100.0                              |
| c. Combined Decomposition of Observed Change in CV From 1970–2013 (PSID and census data) Due to: |               |                                       |                                    |
| Change among newlyweds married 1940–2013   | .0061         | 2.7                                   | 16.3                               |
| Change after first year of marriage for those married 1940–2013                                  | .0291         | 13.0                                  | 77.8                               |
| Changing marital duration distributions  | .0022         | 1.0                                   | 5.9                                |
| Total  | .0374         | 16.7                                  | 100.0                              |

Sources: 1970–2013 Panel Study of Income Dynamics (PSID) and 1940, 1960, 1970, and 1980 U.S. decennial censuses.