Demography (2022) 59(6):2161–2186 Published online: 11 October 2022
DOI 10.1215/00703370-10271332

Explaining Declining Educational Homogamy: The Role of Institutional Changes in Higher Education in Japan

Fumiya Uchikoshi

ABSTRACT Research on educational assortative mating has devoted much attention to educational expansion but has been less focused on a concurrent trend of importance: growing differentiation among higher education institutions. In this study, I examine whether the bifurcation between high- and low-tier institutions in the context of high participation in tertiary education may clarify the mixed evidence on educational homogamy trends across countries. I apply log-linear and log-multiplicative models to analyze trends in educational assortative mating in Japan, which is characterized by a clear, widely acknowledged hierarchy of institutional selectivity. I find that the odds of homogamy are higher among graduates of selective universities than among graduates of nonselective universities. Further, assortative mating trends among graduates of selective and nonselective universities have diverged in recent years. This latter finding perhaps reflects that with the more rapid increase in the share of female students enrolled in less selective institutions, their opportunities to "marry up" have decreased. Results point to the importance of the growing heterogeneity of institutional characteristics, which was obscured in earlier studies, for understanding the impact of educational assortative mating on economic inequality.

KEYWORDS Marriage • Education • Assortative mating • Japan

Introduction

> Merely quantitative differences beyond a certain point pass into qualitative changes.
>
> —Karl Marx, *Capital: A Critique of Political Economy, Volume I* (1867/1909:338)

The question of who marries whom is of great interest to demographers and stratification researchers. Research on assortative mating suggests that an increase in educational homogamy at the top of educational distribution may affect economic inequality (Burtless 1999; Schwartz 2010) and the intergenerational transmission of advantages (Breen and Andersen 2012; Breen and Salazar 2010; Esping-Andersen 2007; Torche 2010). Of particular theoretical interest to researchers has been how

ELECTRONIC SUPPLEMENTARY MATERIAL The online version of this article (https://doi.org/10.1215/00703370-10271332) contains supplementary material.

educational expansion affects educational homogamy trends (Blossfeld 2009; Kalmijn 1998; Schwartz 2013). Explanations vary, with some hypotheses predicting a positive influence of educational expansion (Blossfeld 2009; Blossfeld and Timm 2003; Kalmijn 1998; Mare 1991; Rauscher 2015) and others predicting the contrary (Smits 2003; Smits and Park 2009).

Empirical evidence on educational expansion's effects on educational homogamy is also inconsistent (Blossfeld 2009; Hout and DiPrete 2006). In absolute terms, with educational expansion and therefore a greater number of women than men in higher education, educational hypergamy (women marrying up) is decreasing, whereas both homogamy and hypogamy (women marrying down) are increasing in many countries (Esteve et al. 2012, 2016; van Bavel et al. 2018).[1] However, after controlling for compositional differences in educational attainment across time, research has found that relative trends in educational homogamy vary across countries (Hout and DiPrete 2006).[2]

I argue that those studies have overlooked an important mechanism: the growth in institutional heterogeneity. Prior studies have argued that the *quantitative* change in higher education has transformed the *qualitative* aspects of higher education. Specifically, education expansion is accompanied by a growth of institutional heterogeneity through the proliferation of lower tier institutions (Arum et al. 2007; Hoxby 2009). The impacts of the growth of institutional heterogeneity could be driven by two mechanisms. First, it could be driven by a *compositional* process: the baseline odds of homogamy for graduates of lower tier institutions may differ from those of higher tier institution graduates, whereas the relative distribution of these graduates has changed over time. Specifically, the former may be more likely to marry non–college graduates than are members of the most selective group, who are more likely to marry graduates of equally selective educational institutions (Arum et al. 2008). If so, the increase in the number of graduates of lower tier institutions may decrease the odds of homogamy among college graduates if no compositional adjustment is made. Second, it could be driven by a *diverging* process: the odds of homogamy for lower tier and higher tier graduates have changed over time, net of the compositional changes. If the boundary between selective and less selective groups has intensified with the increase in the number of lower tier institutions, then recent cohorts of these graduates of selective universities may be increasingly more likely to marry selective college graduates.[3] If correct, this contributes to mitigating the decline in educational homogamy.

This study is motivated by the concern that ignoring the growth of within-group variation in higher education may prevent the accurate evaluation of educational

[1] Research on educational assortative mating typically views higher education as a single category for all types of four-year (and higher) tertiary education.

[2] Using simple categorical measures of education, prior studies have measured educational assortative mating in two ways: (1) the overall prevalence of different types of pairings; or (2) the relative likelihood of different pairings, net of marginal distributions. The current study focuses on the second type of measure.

[3] Arum and Roksa (2014) defined U.S. college selectivity based on the SAT percentile scores of college entrants. The university hierarchy in Japan reflects the difficulty of entrance examinations (Ishida 2007), but institutions that require higher entrance examination scores are often historically prestigious. Therefore, selectivity measures based on entrance examinations and institutional prestige are highly correlated, and I use selectivity.

assortative mating trends. Although previous studies mentioned this growth as a likely explanation of current educational homogamy trends (Arum et al. 2008; Hersch 2013; Schwartz and Mare 2005), they did not evaluate this possibility by explicitly modeling the implications of the growing differentiation in higher education for assortative mating trends. A focus on the growing heterogeneity among university graduates in terms of their institutional selectivity could help decipher the mixed evidence on the trends in educational homogamy across countries and provide new insights into the potential role of educational assortative mating in stratification and inequality.

Another focus of this study is the relative gender difference in the expansion rate. Previous studies have assumed that the odds of educational homogamy net of compositional changes are less affected by the different expansion rates by gender. However, the odds of marrying homogamously are a function of not only one's educational group size but also the relative proportions of males and females within one's educational level. Thus, examining both the expansion of higher education and gender differences in rates of expansion is critical for understanding the putative role of educational expansion in generating trends in educational homogamy. With this consideration in mind, the current study explicitly examines female hypergamy patterns in university education.

I focus on Japan, which provides an interesting case of potentially broader relevance to other societies because of its clear and widely acknowledged selectivity-based hierarchy of higher education institutions. Educational homogamy in Japan has declined continuously since the 1950s (Fujihara and Uchikoshi 2019; Fukuda et al. 2021; Miwa 2007). Increased postsecondary educational attainment in Japan has been promoted through the growth of private institutions, including upgrades of private junior colleges, which are seen as lower in the selectivity hierarchy (Ishida 2007). If this increasing share of private universities has reduced the relative value of tertiary education in the marriage market in Japan, graduates of these institutions may be increasingly likely to marry nongraduates, as one recent study speculated (Fukuda et al. 2020).[4]

The current study addresses three questions. First, I ask whether the strength of homogamy among university graduates varies by the selectivity of the institution they attended. I hypothesize that educational homogamy is stronger for graduates of the most selective universities and less pronounced for graduates of less selective universities. Second, after confirming the previously documented decline in homogamy among university graduates, I examine the extent to which the declining trend reflects a combination of the compositional shift, especially among graduates of lower tier institutions, and an increasing likelihood of homogamy among selective college graduates. Third, I evaluate the potential role of relative gender differences in the rate of higher education by examining the persistence of female educational hypergamy in university education.

This study contributes by updating the general implications of educational assortative mating for stratification research. Specifically, the results of this study imply that the mechanism behind educational assortative mating trends in Japan may also operate

[4] Of course, younger cohorts in Japan are marrying later and less, and these shifts could influence patterns of educational assortative mating. Although interesting and important, these aspects are not directly relevant to the analyses of educational pairing *conditional* on marriage.

in other contexts where educational expansion is characterized by stratification in higher education through the growth of lower tier institutions (Hoxby 2009; Roksa et al. 2007). This study also provides important insights into the potential role of horizontal stratification in contemporary societies (Gerber and Cheung 2008). As an increasing number of individuals enter higher education in many countries, looking only at the vertical aspects of educational attainment obscures a potentially important source of inequality.

Background

Expansion and Differentiation in Higher Education Institutions

Changes in educational assortative mating depend on how institutional contexts influence preferences and the opportunity structure in the marriage market (e.g., Blossfeld and Timm 2003; Rauscher 2015), two components influencing *who marries whom* (Kalmijn 1998). Among the possible institutional mechanisms, educational expansion is particularly relevant. Although prior studies posited varied theoretical expectations, they all assumed that increased access to higher education occurs uniformly. The limited focus on the quantitative increase in the number of highly educated individuals (which I call *expansion*) may obscure another important mechanism that influences the pattern of educational assortative mating: the growth of variation within higher education (which I call institutional *differentiation*) (Arum et al. 2007).

Both opportunity structure and preference perspectives have hypothesized that educational expansion can increase educational homogamy. On the one hand, structural theory (Blau and Schwartz 1984), which focuses on the role of opportunity structure, explicitly posits that educational expansion increases homogamy, especially among the highly educated, because such expansion increases the possibility of meeting equally educated spouses at the ages when marriage is most likely to occur (Blossfeld 2009; Mare 1991). On the other hand, preference-based hypotheses also predict that educational expansion leads to increased homogamy. Schwartz and Mare (2005), for example, posited that potential spouses' preferences for partners have become more symmetric over time as a result of women's increasing education and earning potential (Oppenheimer 1988). Both hypotheses have been supported with data from many contexts (Han 2010; Hu and Qian 2015; Ravazzini et al. 2017; Wong 2003).

Smits (2003) and Smits and Park (2009), however, predicted an opposite consequence of educational expansion. Their *exclusivity hypothesis* suggests that educational homogamy among college graduates is stronger when their group size is smaller. Their rationale comes from the theory of status closure or status-group credentialism (Collins 1979), which posits that small, elite groups are aware of their advantages. This awareness may increase these groups' motivation to maintain their social boundaries and exclude out-groups (Parkin 1971). If group size increases, however, the relative value of higher education decreases, and barriers to mating with members of elite groups should also decrease. Therefore, this hypothesis predicts that educational expansion promotes intermarriage between educational elites and others. In line with this theoretical expectation, educational assortative mating has declined

in several countries, including Japan (Fujihara and Uchikoshi 2019; Fukuda et al. 2021; Miwa 2007), France (Bouchet-Valat 2014), Denmark (Andrade and Thomsen 2019), Eastern Europe (Katrňák and Manea 2020), and East Asia (Smits and Park 2009).

The exclusivity hypothesis better aligns with this study's perspective on the co-occurrence of expansion and differentiation than other hypotheses stated earlier because this hypothesis predicts that a *quantitative* increase in group size is accompanied by *qualitative* changes in the value of higher education in the marriage market. However, even this hypothesis does not consider the likely heterogeneity among university graduates. The distinction between *expansion* and *differentiation* provides important insights, especially when the growth of less selective institutions promotes an increase in the number of people with higher education (Arum et al. 2007:5). Although they only indirectly addressed the topic, a few studies have found that college selectivity is associated with marrying spouses from postsecondary institutions with similar academic selectivity (Arum et al. 2008; Feng 2022; Uchikoshi and Raymo 2021). These results suggest that graduates of selective institutions are more likely to seek marriage partners who are college graduates of similarly ranked institutions to maintain social boundaries, which is consistent with the exclusivity hypothesis.

Arguably, the distinction between educational expansion and differentiation within higher education is not new in social stratification research. Lucas' (2001) *effectively maintained inequality* (EMI) hypothesis provides relevant insights into my research question. This hypothesis posits that educational inequality is maintained even when vertical inequality in educational attainment decreases through improved access to higher education because privileged groups seek qualitative advantages within a given level of education to maintain their positions.[5] Applying this perspective, I expect that to the extent that the importance of selectivity within higher education is constant or increases in tandem with the increase in the number of lower tier private institutions in Japan, the strength of homogamy among graduates of selective universities will increase.

Importantly, these theories have not adequately addressed the potential role of relative gender differences in higher education expansion. Indeed, trends in access to higher education often differ for men and women (DiPrete and Buchmann 2013; Esteve et al. 2012). The gender gap in educational expansion has a direct influence on the absolute rate of educational assortative mating, such as the increasing prevalence of educational hypogamy (Esteve et al. 2012; van Bavel et al. 2018), and the gender gap also critically influences the relative odds of educational homogamy. For example, 100 men and 100 women have a university education. If the total number of university graduates increases by 100 men and 0 women, fewer women per man would have a university degree. Therefore, it is impossible for homogamy to increase under such circumstances because no more than one half of the men with a university degree can marry similarly educated women. This simple example demonstrates the importance of considering both higher education expansion and the relative

[5] Attempts to link the EMI hypothesis to educational assortative mating are not new, as Andrade and Thomsen (2019) mentioned an impact of differentiation in higher education on assortative mating, but their focus was more on diversification of fields of study.

gender differences in expansion rates. This perspective is critical for understanding educational assortative mating in Japan, which is characterized by a strong preference for female hypergamy (Brinton et al. 2021; Raymo and Iwasawa 2005).

The Japanese Context

Trends in Educational Assortative Mating

Much evidence suggests that educational homogamy has declined in Japan (Fujihara and Uchikoshi 2019; Fukuda et al. 2021; Miwa 2007). The overall odds of homogamy, for example, decreased by approximately 25% between the 1950–1954 and 1975–1979 birth cohorts (Fujihara and Uchikoshi 2019). Unfortunately, these studies also treated university degrees and their granting institutions as homogeneous, which limits our understanding of the plausible impacts of the growing heterogeneity in higher education on assortative mating. Importantly, however, a few studies suggested that a closer look at the growth in heterogeneity within higher education provides important insights into the decline in educational assortative mating in Japan. The country has been characterized by the social norm that encourages women to prefer "marrying up" (female hypergamy) (Brinton et al. 2021; Raymo and Iwasawa 2005). This hypergamy norm was rooted in gender-inegalitarian social regimes in which socioeconomic status was systematically lower among women than among men. In contrast to well-established knowledge, Fukuda et al. (2020) found an increase in educational hypogamy among university-educated women who married between 1990 and 2013. They interpreted this finding as suggesting that "the social and economic boundaries between lower-ranked universities and technical colleges may be declining among younger cohorts" (Fukuda et al. 2020:1393).

An Overview of Japan's Higher Education System

Japanese universities are characterized by their position within a clear and widely acknowledged hierarchy of institutional selectivity (Yonezawa et al. 2002).[6] National/public universities are often perceived to be more selective and of better quality, whereas private universities (with a few notable, widely recognized exceptions) are generally thought to be in a lower tier (Ishida 1998; Ono 2008). Importantly, an increase in the number of private institutions has led to a larger share of graduates of these less selective universities in the pool of college graduates.

Figure 1 illustrates two stages of educational expansion and upgrades of junior colleges to four-year universities, which contributed to the growing institutional selectivity. This figure presents trends in (1) male and female entrance rates into

[6] According to Times Higher Education's Japan University Rankings 2022 (https://japanuniversityrankings.jp/rankings/), 10 of the top 10, 36 of the top 50, and 70 of the top 100 universities are national or public institutions. Because national or public universities account for less than 25% of all four-year universities, the overrepresentation of these universities in the ranking supports the claim that national or public universities are perceived to be more selective.

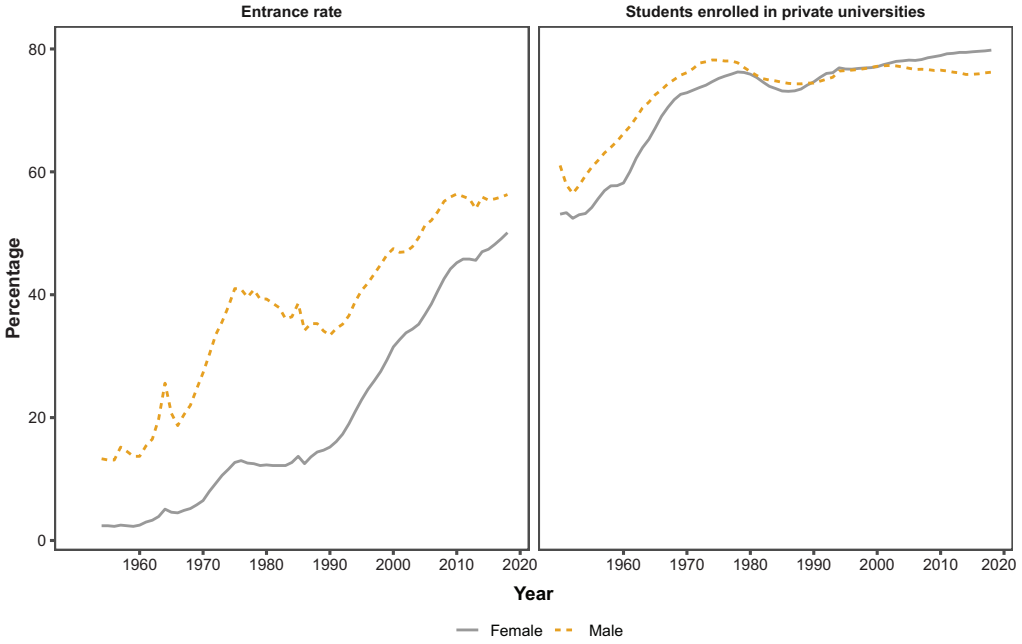

Fig. 1 Trends in university enrollment in Japan. The entrance rate is calculated as the total number of high school graduates who are enrolled. *Source*: School Basic Survey, Ministry of Education, Culture, Sports, Science and Technology.

national, public, and private four-year universities (calculated by the total number of enrolled students out of high school graduates) and (2) the proportion of students enrolled in private universities by gender. During the first stage of private university expansion, from the late 1950s to the late 1970s, the proportion of men and women enrolled in private universities continuously increased. This expansion was driven by newly established private institutions, which are mostly located in the lower ranks of the hierarchy of selectivity (Ishida 2007). The absolute and relative increases in the representation of students from these lower tier private universities thus drove the growth in heterogeneity among university students. This trend continued during the second stage of expansion, from the early 1990s onward, also prompted by the establishment of new private universities. As Figure 1 shows, although the proportion of students enrolled in private institutions slightly decreased during this period for men, it has been stable since 1995, while the proportion increased for women. As in the first stage of expansion, the private universities that contributed to the second stage of higher education expansion are still considered less selective (Ishida 2007).

The upgrade of junior colleges to private universities is another mechanism through which heterogeneity across universities in Japan has grown. According to government statistics (Ministry of Education, Culture, Sports, Science and Technology (MEXT) 2022), most junior colleges are established by private institutions (84% as of 1995), and they frequently have a high concentration of female students (almost 90% of the students enrolled in junior colleges from the 1980s). As women's opportunities to enter occupational careers increased, female students began to aim for

a four-year university (Edwards and Pasquale 2003). Suffering from a shortage of applicants, many private junior colleges decided to upgrade to four-year universities. Between 1995 and 2022, the number of junior colleges thus decreased from 596 to 309, whereas the number of private four-year universities increased from 415 to 620 (MEXT 2022). Importantly, these upgraded institutions have been less selective in recruiting students, suggesting that private institutions have become increasingly heterogeneous in terms of school selectivity.

To summarize, men and women in Japan can be expected to have experienced educational expansion differently in terms of both the timing of expansion and the selectivity of colleges they attended. This education context points to the value of explicitly examining potential gender differences in spouse pairing patterns within university education to clarify the role of educational expansion in assortative mating trends. The more rapid increase in the proportion of women enrolled in private institutions than men suggests that the relative value of higher education has become more heterogeneous for women. If the growing heterogeneity is accompanied by an increase in lower tier private university graduates, women who graduated from private universities would be increasingly less likely to marry up by partnering with men who graduated from national/public universities in recent years.

Research Questions and Hypotheses

Although the social stratification literature has emphasized the importance of horizontal stratification in higher education, consideration of how this factor impacts educational assortative mating has been limited. By linking the growing institutional heterogeneity at the top of educational distribution to the core of the stratification analytical framework, this study updates our understanding of the educational assortative mating trend.

A focus on institutional differentiation in higher education provides several testable hypotheses to explain declining educational homogamy in Japan. Specifically, I test five hypotheses—the first two related to *patterns* of assortative mating, and the last three examining temporal *trends* of assortative mating. All five hypothesis tests are based on estimates conditional on the composition of relevant characteristics (educational attainment and cohorts for Hypotheses 1 and 2, and educational attainment for Hypotheses 3a, 3b, and 4).

First, drawing on the exclusivity hypothesis, Hypothesis 1 expects that the strength of homogamy among university graduates differs by the selectivity of their institutions. I hypothesize that educational homogamy is stronger for the most selective group (national and public university graduates) and less pronounced among less selective groups (private university graduates). If supported, this hypothesis would suggest that educational homogamy among university graduates has declined partly because of the increase in the number of graduates of less selective universities in recent years.

> *Hypothesis 1*: The odds of homogamy are strongest for national and public university graduates and lower for those attending a private university.

Second, the preference for female hypergamy (Brinton et al. 2021; Raymo and Iwasawa 2005) suggests that a similar hypergamy pattern may occur within university

education. Hypothesis 2 expects that women's relative likelihood of marrying up (hypergamy) in terms of college selectivity is higher than that of marrying down (hypogamy).

Hypothesis 2: The odds of female hypergamy are stronger than female hypogamy within university education.

Next, I test whether distinguishing university graduates on the basis of their institutional selectivity explains the decline in educational assortative mating in Japan. Specifically, I test whether the direction of change in assortative mating differs by university selectivity.

Hypothesis 3a: Spouses' educational attainment will be more strongly associated for national/public university graduates than for private university graduates.

Hypothesis 3b: The likelihood that private university graduates will marry national/public university graduates will decrease over cohorts.

Finally, I test whether the female hypergamy pattern within university education—especially female private university graduates marrying national/public university graduates—has declined. This decline could happen because of the compositional mechanism: the proportion of students enrolled in private universities has increased more rapidly for women than men. Alternatively, as the exclusivity hypothesis expects, selective college graduates may respond to the numerical increase in less selective college graduates by maintaining their advantaged status via marriage. In either case, women who are graduates of less selective colleges are increasingly less likely to marry up.

Hypothesis 4: The likelihood of educational hypergamy between women graduating from private universities and men graduating from national/public universities will decrease.

Data and Methods

Data

For this study, I use all the available years of data from two comparable panel surveys: the Japanese Panel Survey of Consumers (JPSC) and the Keio Household Panel Study (KHPS). One reason for the previous literature's lack of consideration of institutional differentiation is data limitations. Most surveys do not ask about the characteristics of the spouse's college (Arum et al. 2008:110; but see Andrade and Thomsen 2019 and Feng 2022 for recent exceptions). By contrast, the JPSC and KHPS collect information about the types of schools from which respondents and their spouses graduated. I combine these two data sets to increase the sample size.

JPSC and KHPS are highly comparative from design to implementation. In terms of sampling strategy, they employed the same sampling technique: a standard stratified two-stage sampling in which the first stage is based on census areas and the second stage involves randomly sampling approximately 10 individuals in each census area. Central Research Services (*Chuo Chosasya*) conducted the fieldwork for both

surveys. Moreover, the initial response rate for the two surveys is almost equal, at 41.4% for JPSC and 41.1% for KHPS (Ishii and Nozaki 2014; Sakaguchi 2014); the retention rates are slightly higher for JPSC (94.4–98.3% vs. 82.7–94.2%). Therefore, in this study, I pool the two samples to form a single data file by extracting information on gender, year of marriage, and respondent's and spouse's education.[7] To make the sample representative of the national population, I construct cross-sectional and longitudinal weights. Estimated results are based on the weighted sample (see the online appendix for details on constructing the weights).

The 1993 JPSC was the first nationally representative longitudinal survey in Japan to target young women (aged 24–34), and the survey is conducted annually. Later waves (1997, 2003, 2008, and 2013) incorporated additional cohorts of women in their mid to late 20s. The first wave of the KHPS was conducted in 2004 with respondents from a nationally representative sample of 4,000 households. A total of 1,400 households were added in 2007 and 2012. Reflecting growing privacy concerns in recent years, the KHPS retention rate is lower than that of the JPSC but is comparable to that of other well-recognized panel studies, such as the Panel Study of Income Dynamics and the Survey of Income and Program Participation (Naoi 2006).[8]

Variables

I use four categories for the husband's and wife's educational attainment: high school or less, including junior high school; junior college, college of technology, or professional training college; private university; and national or public university.

Given my focus on exclusivity and institutional differentiation, I do not consider educational attainment beyond an undergraduate university degree. In my sample of university graduates, 1.5% of respondents also obtained a master's degree or Ph.D.; I use only their undergraduate degree in my analysis. I assess respondents' education provided at the first interview. To measure spouses' education, I use the information provided in the first interview if respondents were already married. Otherwise, I use the information provided at a later wave, after they married.

After I omit cases with missing educational information, 7,434 couples remain (2,685 cases for the JPSC and 4,749 cases for the KHPS). The year of marriage ranges from 1954 to 2015 in this sample. To minimize the possibility that respondents and their spouses graduated before the post–World War II education system reform, I limit the sample to respondents who married between 1970 and 2015, resulting in the removal of 12% of the observations.[9] I then divide the sample into 15-year

[7] I estimated log-linear models separately for the JPSC and KHPS samples. The results are shown in Figures A1 and A2 (online appendix), which replicate Figure 4 in the main text. Substantively, these estimates are comparable.

[8] The retention rate could be problematic in my study if there is any selective attrition by education characteristics, given that I used spouse's education information that respondents provided after they married if they were not married at the time of the first interview. I discuss these points in the online appendix.

[9] Unfortunately, these surveys do not distinguish first from later marriages. Because the prevalence of remarried couples has increased in Japan, the inability to distinguish them from the first-married population may induce biased results.

marriage cohorts (1970–1984, 1985–1999, and 2000–2015). The division between the late 1990s and early 2000s is critical to this study because of the upgrading of many junior colleges to four-year private universities in this period, which likely contributed to the growth in heterogeneity among four-year universities.

Methods

Assortative mating is formed through at least two mechanisms: preference and opportunity (Kalmijn 1998). Because the observed marriage patterns include the contribution of each mechanism, an appropriate method is needed to identify which factor contributes to the decline in a given marriage pattern, such as educational homogamy. The current study examines educational homogamy net of marginal distributions of men's and women's educational attainment. Thus, I control for compositional changes in educational attainment between men and women. I then examine changes in the odds ratio of homogamy conditional on educational attainment distributions.

To capture these odds ratios and their changes, which are assumed to capture preference,[10] I apply log-linear and log-multiplicative models. These models have been the gold standard for describing assortative mating patterns and trends (for a methodological review, see Lichter and Qian 2019). Suppose we apply this method to three-way tables of the husband's educational attainment, $H(i=1, \ldots, 4)$; the wife's educational attainment, $W(j=1, \ldots, 4)$; and the respondent's marriage cohort, $C(k=1, \ldots, 3)$. The baseline model is the conditional independence model, which assumes the independence of wives' and husbands' education:

$$\ln F_{ijk} = \lambda + \lambda_i^H + \lambda_j^W + \lambda_k^C + \lambda_{ik}^{HC} + \lambda_{jk}^{WC}, \qquad \text{(Model 0)}$$

where F_{ijk} is the expected frequency of the (i, j, k) cell, consisting of husbands with education i and wives with education j who married in cohort k.[11] I set this model as the baseline and expand on it by adding other parameters. Each value for education and cohort corresponds to the categories that I defined previously. For example, F_{433} indicates the frequency of couples in which the husbands are national/public university graduates, the wives are private university graduates, and the marriage occurred in a year during 2000–2015.

I examine various extensions to the baseline model to test my hypotheses. First, Model 1a represents the quasi-independence model of homogamy:

$$\ln F_{ijk} = \lambda + \lambda_i^H + \lambda_j^W + \lambda_k^C + \lambda_{ik}^{HC} + \lambda_{jk}^{WC} + \delta_{ij}^{HW}, \qquad \text{(Model 1a)}$$

where δ_{ij}^{HW} follows Matrix 1. This model estimates the likelihood that homogamy is consistent across education levels.[12] The model also treats marriage between all university

[10] For a critique of this interpretation, see Logan (1996).

[11] All the models include category l (not shown in the equations), where the cell is distinguished by whether it comes from JPSC or KHPS.

[12] These parameters do not capture homogamy among junior college graduates, given that prior work argued that trends in homogamy among junior college graduates are stable (Fujihara and Uchikoshi

graduates equally regardless of the selectivity of their institutions. To fit a different parameter for each cell, I use design matrices (shown in Table A1, online appendix). The design matrix for Model 1a, for example, corresponds to Matrix 1, where homogamy among individuals with a high school education or less is 1, and university homogamy is expressed as 2; the reference category (=0) is other types of assortative mating.

Next, to capture a gradient in the odds of homogamy based on institutional selectivity, I estimate three models (1b–1d) to test Hypothesis 1. Model 1b assumes distinct diagonal parameters among university graduates but treats off-diagonal cells among graduates equally (see Matrix 2 in Table A1, online appendix), and Model 1c captures the strength of the association for each cell on the main diagonal in comparison to that for the off-diagonal cells (see Matrix 3 in Table A1).

Although Models 1a–1c examine homogamy *within* educational groups, Model 1d reflects the permeability of barriers to marriage *across* educational types between spouses. The equation is defined as follows:

$$\ln F_{ijk} = \lambda + \lambda_i^H + \lambda_j^W + \lambda_k^C + \lambda_{ik}^{HC} + \lambda_{jk}^{WC} + \gamma_{ij}^{HW}, \qquad \text{(Model 1d)}$$

where $\gamma_{ij}^{HW} = \sum_{q=j}^{i-1} \gamma_q$ for $i > j$, $\gamma_{ij}^{HW} = \sum_{q=i}^{j-1} \gamma_q$ for $i < j$, and $\gamma_{ij}^{HW} = 0$ for $i = j$. This parameter is additive. Thus, for example, the odds ratio for husbands with a national/public university education crossing barriers and marrying wives with a junior college education is $\gamma_{42}^{HW} = \gamma_2 + \gamma_3$.

When I discuss the model fit for these models, I also reference the saturated model. This model provides us with a reference for selecting the best-fitting models. Models with better fit statistics relative to the saturated model can more parsimoniously capture the association. The equation for the saturated model is as follows:

$$\ln F_{ijk} = \lambda + \lambda_i^H + \lambda_j^W + \lambda_k^C + \lambda_{ik}^{HC} + \lambda_{jk}^{WC} + \psi_{ij}^{HW}.$$

Model 2 is used to test Hypothesis 2 (the persistence of female hypergamy), which relaxes the quasi-symmetry assumption that characterizes the off-diagonal parameters in Model 1b (see Matrix 4 in Table A1).

Next, I examine whether the degree of educational assortative mating varies by marriage cohort. To investigate the trends in educational assortative mating, I use the same model that Schwartz and Mare (2005) did:

$$\ln F_{ijk} = \lambda + \lambda_i^H + \lambda_j^W + \lambda_k^C + \lambda_{ik}^{HC} + \lambda_{jk}^{WC} + \lambda_{ij}^{HW} + \delta_{ijk}^{HWC}, \qquad \text{(Model 3a)}$$

where δ_{ijk}^{HWC} follows Matrix 1. I also apply the log-multiplicative layer effects models (Xie 1992) to estimate changes in the strength of the associations over time while assuming that the overall patterns are constant:

$$\ln F_{ijk} = \lambda + \lambda_i^H + \lambda_j^W + \lambda_k^C + \lambda_{ik}^{HC} + \lambda_{jk}^{WC} + \beta_k^C \delta_{ij}^{HW}, \qquad \text{(Model 3b)}$$

where δ_{ij}^{HW} follows Matrix 1.

2019). Because this study aims to explain the declining trends in educational homogamy, I do not consider homogamy among junior college graduates in my analysis.

Here, δ_{ij}^{HW} indicates the homogamous association between wives' and husbands' educational achievement, and β_k^C is the log-multiplicative parameter. This model produces a parsimonious estimation of changes in the strength of the association with flexibility in specifying the association (Xie 1992). The β parameter is set to 1, with the oldest cohort as the reference. I evaluate changes in the association as the percentage change in this parameter relative to the value for the reference cohort.

To test Hypothesis 3 (increasing odds of homogamy among selective college graduates and decreasing likelihood of less selective college graduates marrying selective college graduates), I apply Models 3c–3e. These models are changing homogamy or crossing models based on the models used to test Hypothesis 1. For example, Model 3c is expressed as follows:

$$\ln F_{ijk} = \lambda + \lambda_i^H + \lambda_j^W + \lambda_k^C + \lambda_{ik}^{HC} + \lambda_{jk}^{WC} + \lambda_{ij}^{HW} + \delta_{ijk}^{HWC}, \qquad \text{(Model 3c)}$$

where δ_{ijk}^{HWC} follows Matrix 2.

Finally, to test Hypothesis 4 (changes in the strength of female educational hypergamy), I apply Model 4. This model uses the same design matrices examined in Model 2 and is expressed as follows:

$$\ln F_{ijk} = \lambda + \lambda_i^H + \lambda_j^W + \lambda_k^C + \lambda_{ik}^{HC} + \lambda_{jk}^{WC} + \lambda_{ij}^{HW} + \delta_{ijk}^{HWC}, \qquad \text{(Model 4)}$$

where δ_{ijk}^{HWC} follows Matrix 4.

Results

Descriptive Results

Figure 2 shows the distributions of educational attainment for married men and women separately using the JPSC and KHPS. Men and women in recent marriage cohorts are more likely to graduate from four-year universities than those in previous marriage cohorts. Despite the general rise in educational attainment among women, gender differences in educational attainment persist among recent cohorts. In terms of heterogeneity by university selectivity, the proportion of national/public university graduates remains largely the same across cohorts, but the proportion graduating from private institutions increases. This finding is consistent with the promotion of women's access to higher education through an increase in the number of private institutions, including schools upgraded from junior colleges.

In Figure 3, changes in the observed proportions of educational homogamy, female hypergamy, and female hypogamy are presented on the left; the expected proportions, calculated under the assumption that the husband's and wife's education levels are independent of each other, are shown on the right. The observed data reveal that 48% of marriages in the 1970–1984 cohort are homogamous, and homogamy still characterizes more than 37% of the latest cohort. In contrast, both educational hypergamy and educational hypogamy increase from the oldest cohort to the latest cohort. Trends for the expected proportions (on the right) are similar to those for the observed proportions. The proportion of homogamy decreases across cohorts, and the proportions

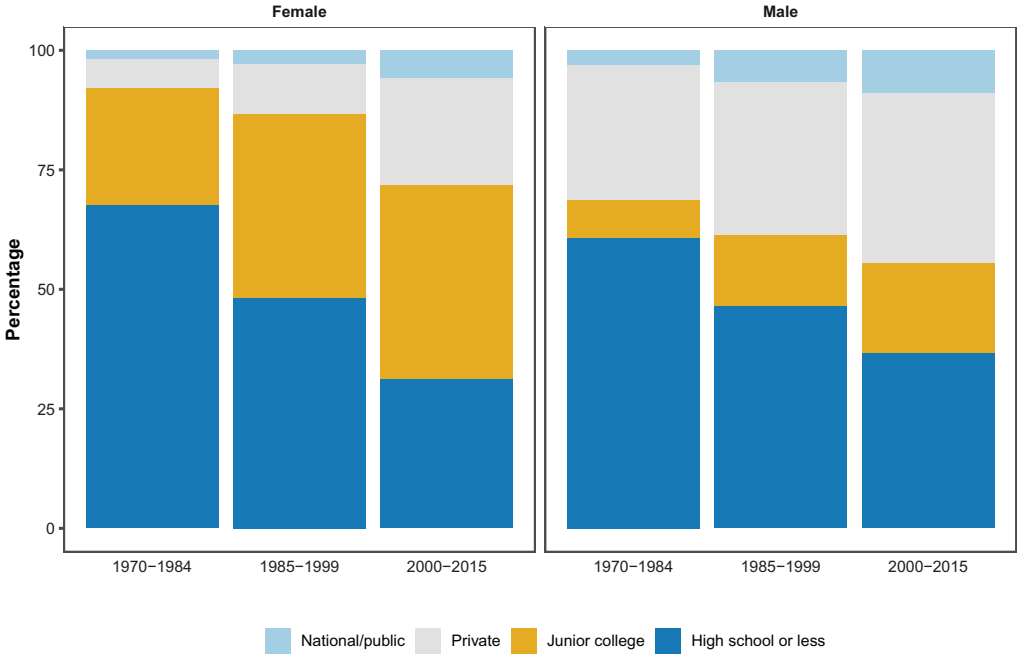

Fig. 2 Respondents' educational attainment, by gender and marriage cohort

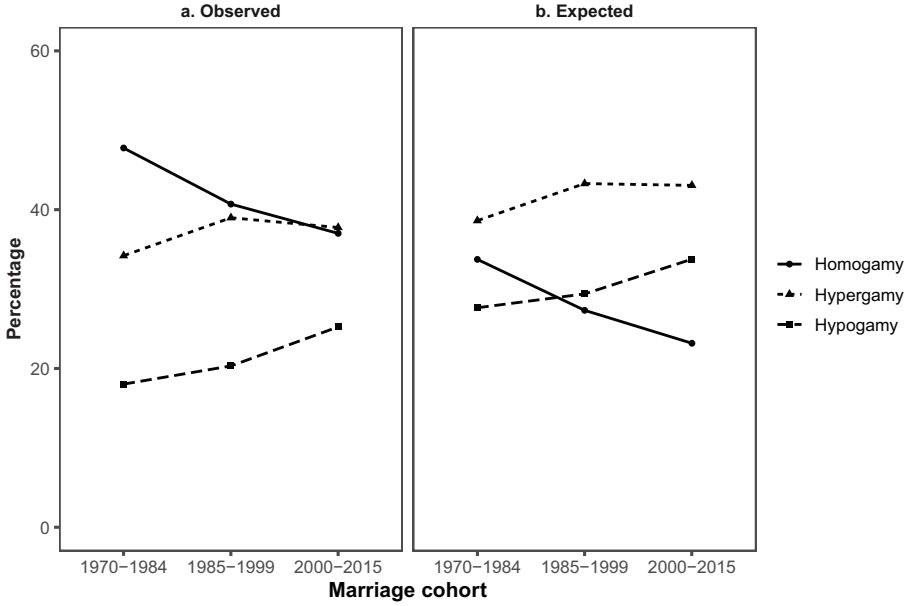

Fig. 3 Observed and expected distributions of homogamy, hypergamy, and hypogamy, by marriage cohort

Table 1 Goodness-of-fit statistics for the models

Model			Goodness-of-Fit of Models			
			G^2	*df*	ID (%)	BIC
Baseline						
0	[*HC WC*]	Conditional independence	1,793.2	27	19.1	1,551.9
Models for Hypothesis 1						
1a	[*HC WC* δ^{HW}]	Homogamy (Matrix 1)	219.7	25	4.8	−3.7
1b	[*HC WC* δ^{HW}]	Homogamy (Matrix 2)	91.8	23	3.7	−113.7
1c	[*HC WC* δ^{HW}]	Homogamy (Matrix 3)	257.7	23	4.3	52.2
1d	[*HC WC* γ^{HW}]	Crossing	93.8	24	3.8	−120.7
Model for Hypothesis 2						
2	[*HC WC* δ^{HW}]	Homogamy (Matrix 4)	85.8	22	3.7	−110.8
Models for Describing Assortative Mating Trends						
3a	[*HC WC HW* δ^{HWC}]	Changing homogamy (Matrix 1)	23.5	14	1.0	−101.6
3b	[*HC WC* $\delta^{HW}\beta^{C}$]	Homogamy, LM (Matrix 1)	206.6	23	4.2	1.1
Models for Hypotheses 3a and 3b						
3c	[*HC WC HW* δ^{HWC}]	Changing homogamy (Matrix 2)	11.8	10	0.6	−77.6
3d	[*HC WC HW* δ^{HWC}]	Changing homogamy (Matrix 3)	14.0	10	0.6	−75.4
3e	[*HC WC HW* γ^{HWC}]	Changing crossing	16.6	12	0.8	−90.7
Model for Hypothesis 4						
4	[*HC WC HW* δ^{HWC}]	Changing homogamy (Matrix 4)	9.5	8	0.5	−62.0

of hypergamy and hypogamy increase. This result suggests that the observed trends are largely due to changes in the marginal distributions of men's and women's educational attainment. One interesting finding is that expected educational homogamy is lower than the observed rate. Intuitively, it is plausible that educational expansion could lead to an increase in educational homogamy as the distributions of men's and women's education become more similar. However, the figure shows that this is not the case in Japan, which is not surprising given the studies cited earlier.

Log-Linear and Log-Multiplicative Models

To investigate the relative association between wives' and husbands' educational attainment, I estimate log-linear and log-multiplicative layer effects models. Table 1 provides the goodness-of-fit statistics for the models: the log-likelihood ratio chi-square statistic (G^2), the degrees of freedom (*df*), the index of dissimilarity (ID), and the Bayesian information criterion (BIC).[13] The ID is the proportion of misclassified cases in a given model: the smaller the ID, the better the model fit. The BIC adds a penalty for the number of parameters related to G^2 in a given model: the more negative the BIC, the better the model fit. One advantage of referring to the BIC is that for a fully saturated model, this criterion should be 0 (Raftery 1995). Thus, models with

[13] The ID is defined as $\sum \left| F_{ijk} - f_{ijk} \right| / 2n$, where f_{ijk} denotes the observed frequencies of the (i, j, k) cell. The BIC is defined as $G^2 - \log n \times df$.

a BIC lower than 0 are preferred over models with a positive BIC. Throughout the analysis, I prioritize the BIC.

Assortative Mating Patterns Within University Education

In the baseline model, Model 0 (for conditional independence), 19% of cases are misclassified. Model 1a adds homogamy parameters, which improve the model fit relative to Model 0. I estimate Models 1b–1d to test Hypothesis 1. In Model 1b, which uses Matrix 2, I define homogamous marriages as the association in each cell on the main diagonal above college education (3 and 5) and treat the off-diagonal associations among university graduates as a separate group (4). This model is the best-fitting homogamy model in terms of the BIC. However, it is slightly worse fitting than the saturated model, which allows for a saturated association between wives' and husbands' educational achievement (Ψ_{ij}^{HW}) (−126.4; results not shown). This result suggests that the association between husbands' and wives' education among university graduates is heterogeneous in terms of their institutions' selectivity levels, and heterogamy based on their selectivity is distinguishable from those on the main diagonals. Model 1d, which adds crossing parameters, also displays an improved fit, suggesting that the crossing model is also sufficient to capture patterns of assortative mating parsimoniously, although the BIC for this model is slightly worse than that for the saturated model.

To test Hypothesis 1 and for descriptive purposes, I present in panel a of Figure 4 the Model 1b parameter estimates shown in Table 1. The parameters of the diagonal cells that represent university education types (private university and national/public university) tend to be larger (1.65, 3.06) than those representing individuals who did not graduate from a university (i.e., high school graduates; 1.28). Substantively, for example, the odds ratio for homogamy among national/public university graduates is 21.3 (= exp(3.07)), implying that these university graduates are 21 times more likely than others to marry spouses with the same type of education. Additionally, if this parameter is interpreted as homogamy strength, homogamy is strongest among national/public university graduates (the 95% confidence interval ranges from 2.74 to 3.40) and is weaker among graduates of private universities (from 1.48 to 1.81). Thus, homogamy strength among university graduates differs based on their institution's selectivity under the assumption that the parameters are the same across cohorts, which supports the exclusivity hypothesis (Hypothesis 1).

The Model 1d crossing parameter estimates shown in panel b of Figure 4 show that marrying across educational attainment statuses is less likely to occur than marrying within the same educational level, as expected. Understandably, the crossing parameter is more negative for marriages between junior college and private university graduates than for marriages between high school and junior college graduates. Meanwhile, the magnitude of the crossing parameter for marriages between private university and national/public university graduates is comparable to that between junior college and private university graduates. This result suggests that the difficulty of crossing the education boundary is mainly found between educational levels.

Next, I estimate Model 2a to test Hypothesis 2. These estimates, shown in panel c of Figure 4, indicate that the relative likelihood of female hypergamy and

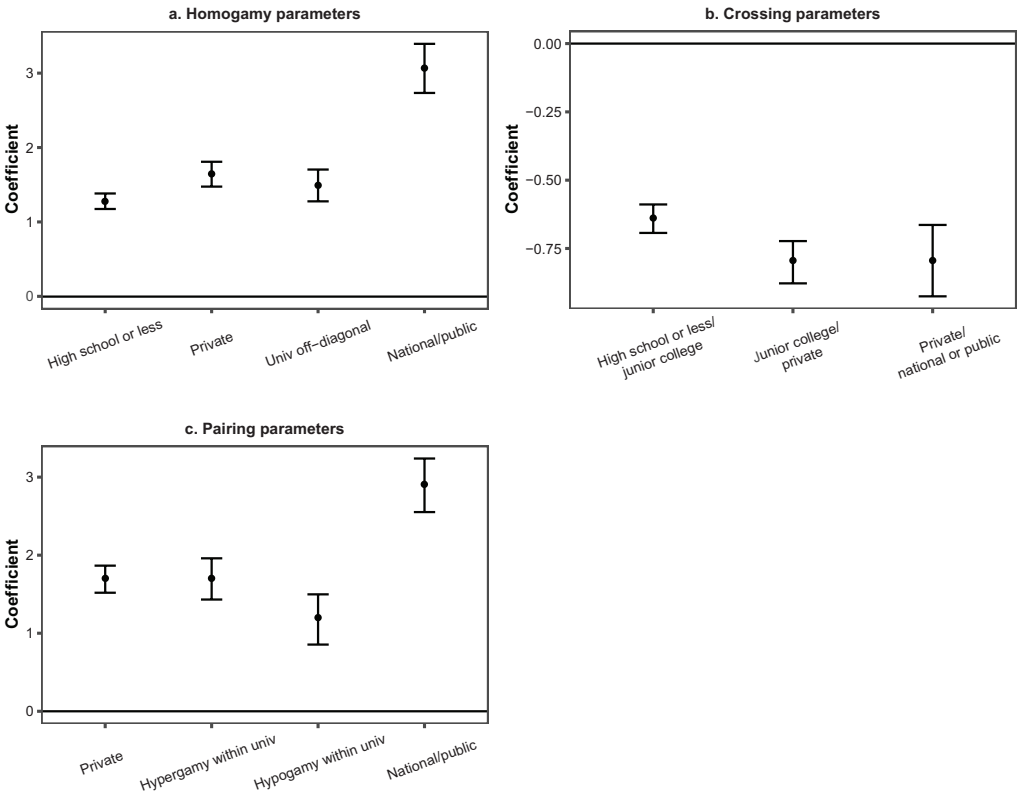

Fig. 4 Parameters of association between husbands' and wives' educational attainment. Panel a is estimated by Model 1b, panel b is estimated by Model 1d, and panel c is estimated by Model 2a. Error bars indicate the 95% confidence intervals.

hypogamy is positive. However, hypergamy is more likely to occur than hypogamy, net of compositional changes. Specifically, the odds ratio of hypergamy among university graduates is 4.9 (= exp(1.70), 95% confidence interval = 1.43 to 1.96), while that of hypogamy is 3.3 (= exp(1.18), 95% confidence interval = 0.85 to 1.50).

Changing Assortative Mating Patterns Within University Education

To describe assortative mating trends by education, I estimate Model 3a, which adds parameters to estimate changes in each of the educational assortative mating types articulated in Model 1a. The BIC for this model is lower than that for Model 1a, indicating that the degree of educational homogamy changes over time.

Panel a of Figure 5 presents changes in homogamy for Model 3a and shows that homogamy is less likely to occur over time across cohorts relative to the reference cohort. This result is consistent with those of previous studies suggesting a continuous decline in educational homogamy in Japan (Fujihara and Uchikoshi 2019; Fukuda et al. 2021; Miwa 2007). To examine the trend in educational assortative mating using

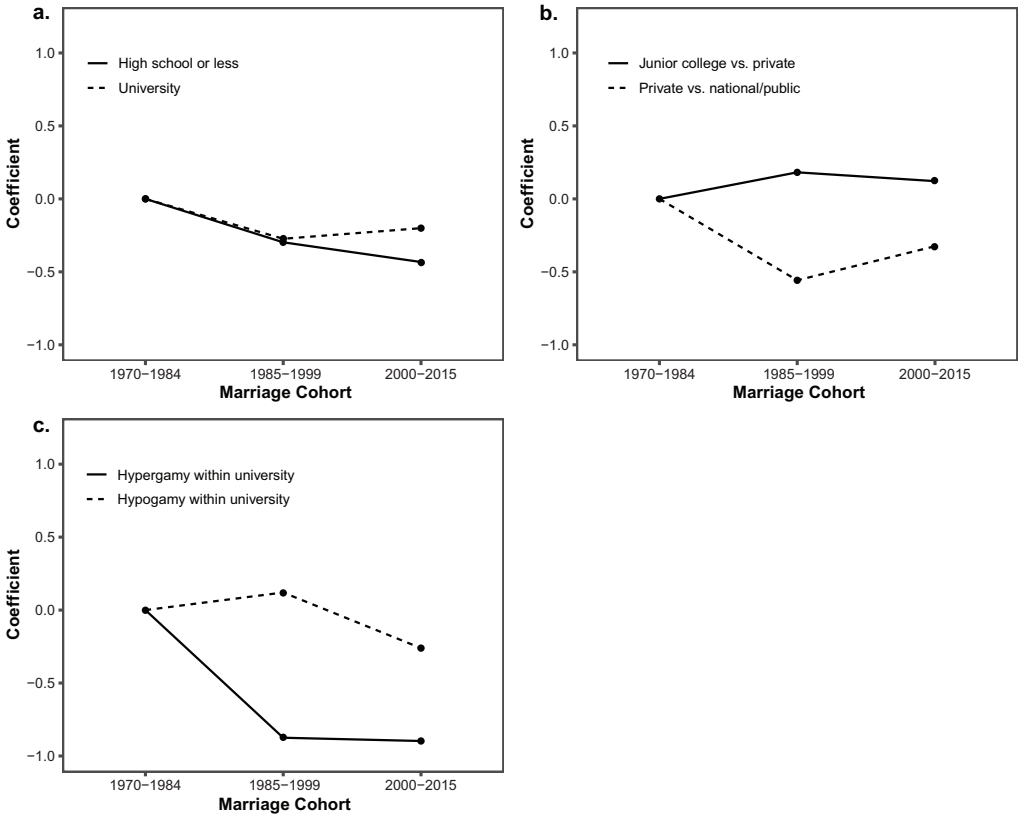

Fig. 5 Changes in the homogamy and crossing parameters, by marriage cohort. Panel a is estimated by Model 3a, panel b is estimated by Model 4d, and panel c is estimated by Model 5a. Coefficients on the *y*-axis show the degree to which educational assortative mating varies by marriage cohort, which is expressed as δ_{ijk}^{HWC} in the equations.

a more parsimonious model, I also apply a log-multiplicative model (Model 3b). For this model, the BIC is higher than that of the changing homogamy model. Although the model fit is worse, the log-multiplicative parameters (β_k^C) estimated in Model 3b suggest that the association between the husband's and wife's educational attainment, measured in terms of log-odds ratios, declines by 26% over the three cohorts (results not shown).

To test Hypothesis 3, I examine Models 3c–3e, which add parameters to estimate changes in assortative mating among graduates of each educational type. The BIC is lower than 0 across the models but indicates a poorer fit than the BIC for the reference models (except for the comparison between Model 1c and Model 3d), suggesting that there is no evidence for cohort change in assortative mating. Thus, the results should be considered descriptive, although the chi-square tests of the G^2 statistic between the hierarchical models (between Models 1b and 3c, and between Models 1d and 3e) reveal that the null hypothesis that these models are the same is rejected at the 1% level of statistical significance. These results, similar to results from Model

3a, suggest that educational homogamy has declined overall but that distinguishing between university graduates by institutional selectivity provides a more nuanced picture of these trends.

Panel b of Figure 5 presents changes in crossing parameters (Model 3e), the BIC of which is relatively lower than in other competing models (Models 3c and 3d). Positive coefficients on the cohort interaction mean more intermarriage in recent cohorts, whereas negative coefficients indicate less intermarriage. The results show that the difficulty of crossing educational attainment boundaries between private and national/public university graduates increases by 32.0% across the three cohorts, consistent with Hypothesis 3b. In contrast, crossing boundaries between junior college and private university graduates declines by 12.1%. In terms of the odds of homogamy, this implies homogamy among national/public university graduates increased, consistent with Hypothesis 3a and 3b.

Finally, I estimate Model 4 to test Hypothesis 4, which posits that educational hypergamy among university graduates declines more rapidly than those hypogamy marriages. Because the model fit statistics for Model 5a are worse than those of the reference model (Model 2a), I present results for descriptive purposes rather than to detect the best-fitting model. Again, though, the chi-square tests of the G^2 statistic between the hierarchical models indicate that I can reject the null hypothesis that these models are the same at a 1% level of statistical significance. Panel c of Figure 5 shows that the cohort interaction with hypergamy is negative but that hypogamy trends are stable, consistent with Hypothesis 4. Specifically, educational hypergamy decreases by 90% over three marriage cohorts, but educational hypogamy declines modestly (by 26%).

A Consideration of Other Potential Explanations for the Diverging Patterns

Because the diverging pattern in educational homogamy by college selectivity is a key finding, it is worth considering potential explanatory factors other than college expansion. Supplementary analyses examined two possibilities (see Table A2, online appendix). First, those familiar with the literature on U.S. higher education may wonder if the increasing selectivity of elite colleges (Hoxby 2009) can explain the diverging pattern. I estimated ordered logit models separately for men and women and limited the sample to three types of university graduates. Results did not reveal evidence that the selection into selective colleges, measured by father's education, has changed.

Second, the education–income gradient may have changed, similar to the increasing labor market return to a college degree in the United States (Autor 2010; Goldin and Katz 2009). I estimated an ordinary least-squares regression for logged hourly wage at age 35, limiting the sample to men because women's employment is often interrupted by family events. My analysis suggests that returns to selective colleges did not change over time, in line with earlier studies finding that earnings premiums among college graduates have not increased in Japan (Kawaguchi and Mori 2016). Ideally, one would examine whether women's returns to selective colleges changed because an increase in their returns would indicate that the diverging homogamy

patterns between national/public university and private university graduates may be driven by the increase in women's economic potential that makes them more attractive in the marriage market (from men's perspective). Perhaps more importantly, the value of women's college education in the marriage market has changed not only because of the increase in the economic return to women's education but also because of the growing symmetry in men's and women's economic opportunities. Such symmetry is likely to increase men's emphasis on their female spouse's earning role (National Institute of Population and Social Security Research 2017) or change their (stereotypical) views about career-oriented women as potential marital partners (Woźny 2022). Unfortunately, I cannot directly examine how such changing views of women's economic role potentially affect the educational homogamy pattern in Japan while examining the growth in within-group variation in higher education selectivity. Future studies should examine this point.

Third, there are good reasons to expect that delayed and fewer marriages among younger cohorts in Japan (Raymo et al. 2015) will shape assortative mating patterns. For instance, Mare's (1991) time gap hypothesis suggests that delayed marriage will decrease educational homogamy because the time between graduation and marriage will increase exposure to potential partners with different educational backgrounds. In that sense, the declining trend in educational homogamy in Japan may reflect delayed marriage. Meanwhile, Oppenheimer's (1988) classical theory on marriage timing states that delayed marriage may allow singles to estimate their potential spouse's earning potential more accurately, leading to more homogamy. I examined these speculations using an event-history technique that allowed me to incorporate both the timing of marriage and assortative mating patterns. Results from the analysis, shown in the online appendix and fully discussed in Uchikoshi (2018), suggest that the age at marriage does not change the likelihood of college graduates' marriage to a similarly educated spouse in Japan. Rather, the declining educational homogamy among college graduates is far more likely to be explained by a relative increase in highly educated women, who tend to prefer marrying similarly educated men (educational homogamy), than by a decline in the relative supply of these men, resulting in so-called marriage market mismatch (Raymo and Iwasawa 2005). In a context where people are marrying less, the marriage market mismatch is likely more critical for homogamy among less educated individuals, among whom the declining marriage rate is more pronounced, especially for men (Fukuda et al. 2020). Although this is not a focus of this article, future studies should examine whether the lower marriage rate among less educated men affects assortative mating patterns.

Discussion

This study investigates the patterns of educational assortative mating in Japan over time, focusing on the roles of expansion and institutional differentiation in higher education. This article's primary contribution is demonstrating that patterns of educational assortative mating are dependent on how educational categories are measured in the context of rapid educational expansion. First, the results from using a finer categorization of university graduates than previously examined demonstrate that the strength of educational homogamy differs according to the level of institutional

selectivity: the likelihood of homogamy is greater among national/public university graduates than among private university graduates. These findings are consistent with the exclusivity hypothesis (Hypothesis 1) and add to our understanding of heterogeneity in school selectivity–based assortative mating patterns, which was obscured in earlier studies. Another interesting finding is that among women, educational hypergamy is more likely to occur than educational hypogamy, even among university graduates. This result supports Hypothesis 2 and the notion of a strong preference for status hypergamy in Japan (Brinton et al. 2021; Raymo and Iwasawa 2005).

Second, in addition to the initial difference in homogamy strength across these groups, there has been a diverging trend in educational homogamy, which declined by approximately 27% over the three marriage cohorts. The tendency to marry similarly educated spouses has increased among national/public university graduates, whereas private university graduates have become increasingly less likely to marry these selective university graduates, consistent with the institutional differentiation hypothesis (Hypotheses 3a and 3b). Further, these less selective university graduates more frequently marry partners who did not complete college, although this change is small, at 12% (panel b, Figure 5). This finding was not hypothesized but echoes the interpretation by Fukuda et al. (2020) that an increase in hypogamy among university-educated women reflects the declining socioeconomic boundaries between less selective universities and other postsecondary institutions.

These results suggest that a relative increase in the number of private university graduates influenced educational homogamy patterns through two processes: (1) a compositional process in which the relative increase in less selective college graduates decreased the odds of educational homogamy among college graduates, and (2) a diverging process in which the increase in odds of homogamy among selective college graduates mitigated the decline in educational homogamy. Further, aside from theoretical expectations, the slight increase in the likelihood of intermarriage between less selective college graduates and junior college graduates contributed to the decline in educational homogamy among college graduates. This study reveals such processes by distinguishing college graduates by the selectivity of the institution they attended.

Finally, consistent with Hypothesis 4, results suggest a decrease in female educational hypergamy but not necessarily for educational hypogamy. These findings provide important insights that improve the theoretical framework for the impact of institutional differentiation in higher education, which has not fully considered the role of relative gender difference in higher education expansion. Possibly reflecting the more rapid increase in the share of female students enrolled in private institutions, opportunities to "marry up" for women who graduate from private institutions decreased, and these women were more likely to marry non–university graduates. Hence, the results of this study imply that it is critical for us to explicitly consider the role of relative gender differences in the rate of expansion in higher education.

A few limitations of the study are noteworthy. First, the classification of selectivity among university graduates in this analysis is crude. For example, there are a few recognizable selective private universities (e.g., Keio or Waseda), whereas earlier work has suggested that the odds of homogamy among these selective private university graduates are lower than those among graduates of selective national universities (Uchikoshi and Raymo 2021). Still, future studies could provide an improved picture by using a finer selectivity classification, such as one based on school name, rather

than the simple national/public–private distinction. Second, because this study used cross-sectional information on spouse pairing, a potential bias was not addressed. In particular, given that older cohorts are more likely to appear to marry homogamously than younger cohorts in cross-sectional data as a result of selective attrition via divorce (Tzeng 1992), the current study may have overestimated the decline in educational assortative mating. Third, this study could not quantify the contribution of the growth of within-group variation in higher education and assortative mating patterns net of compositional changes to trends in educational homogamy. Future studies would benefit from applying a decomposition method to estimate each contribution (e.g., Leesch and Skopek 2022).

Despite these limitations, the findings provide important insights into how horizontal stratification in higher education impacts educational assortative mating. The perspective on growing institutional heterogeneity in higher education may be applicable to other contexts. For example, the facilitation of higher education expansion through institutional differentiation has also occurred in the United States, where the number of for-profit universities increased from the early 1990s until 2010 (National Center for Education Statistics 2019). Researchers have argued that graduates from these colleges end up with heavy student loan debt (Deming et al. 2012) and almost no economic benefits (Cellini and Turner 2019), suggesting that the proliferation of these for-profit colleges may have attenuated the increase in educational homogamy among college graduates (Schwartz and Mare 2005). Thus, future research would also benefit from examining whether the growth in institutional heterogeneity in higher education is associated with changes in educational assortative mating in comparative perspective.

To conclude, the bridging of horizontal stratification and assortative mating, two determinants of social stratification in contemporary societies, provides important insights into overarching questions about social stratification. As a potential determinant of increasing economic inequality, assortative mating has drawn enormous attention (Breen and Andersen 2012; Breen and Salazar 2010; Esping-Andersen 2007; Schwartz 2010; Shen 2021; Torche 2010), although evidence for its influence on inequality is mixed (Schwartz 2013). This mixed evidence might be due to an inappropriate categorization of educational attainment. For example, educational homogamy may increase for a particular subgroup (e.g., selective university graduates) but decrease for other subgroups (e.g., nonselective university graduates). If so, these groups likely impact growing income inequality differently. Therefore, my results point to the importance of the growing heterogeneity of institutional characteristics, which was obscured in earlier studies, for understanding the impact of educational assortative mating on economic inequality. ■

Acknowledgments An early version of this paper was presented at the RC28 summer meeting held at Princeton University on August 15–19, 2019. The Japanese Panel Survey of Consumers and the Keio Household Panel Study were provided by the Panel Data Research Center at Keio University. I thank several anonymous reviewers, Jim Raymo, Christine Schwartz, Eric Grodsky, Leafia Zi Ye, Kelsey Wright, Noah Hirschl, Sawako Shirahase, Sho Fujihara, Ryota Mugiyama, Kohei Toyonaga, Akira Igarashi, and seminar participants at the National Institute of Population and Social Security Research for their helpful comments and suggestions. This research is supported by the Nakajima Foundation and the Eunice Kennedy Shriver National Institute of Child Health and Human Development of the National Institutes of Health under grant P2CHD047879. All errors are my own.

References

Andrade, S. B., & Thomsen, J.-P. (2019). Educational assortative mating: A micro-educational approach. *British Journal of Sociology, 70,* 1245–1275.

Arum, R., Gamoran, A., & Shavit, Y. (2007). More inclusion than diversion: Expansion, differentiation, and market structure in higher education. In Y. Shavit, R. Arum, & A. Gamoran (Eds.), *Stratification in higher education: A comparative study* (pp. 1–35). Stanford, CA: Stanford University Press.

Arum, R., & Roksa, J. (2014). *Aspiring adults adrift: Tentative transitions of college graduates*. Chicago, IL: University of Chicago Press.

Arum, R., Roksa, J., & Budig, M. J. (2008). The romance of college attendance: Higher education stratification and mate selection. *Research in Social Stratification and Mobility, 26,* 107–121.

Autor, D. (2010). *The polarization of job opportunities in the U.S. labor market* (Report). Washington, DC: Center for American Progress; Washington DC: The Hamilton Project. Retrieved from https://economics.mit.edu/files/5554

Blau, P. M., & Schwartz, J. E. (1984). *Crosscutting social circles: Testing a macrostructural theory of intergroup relations*. Orlando, FL: Academic Press.

Blossfeld, H.-P. (2009). Educational assortative marriage in comparative perspective. *Annual Review of Sociology, 35,* 513–530.

Blossfeld, H.-P., & Timm, A. (2003). *Who marries whom? Educational systems as marriage markets in modern societies*. Dordrecht, the Netherlands: Springer Science+Business Media.

Bouchet-Valat, M. (2014). Les évolutions de l'homogamie de diplôme, de classe et d'origine sociales en France (1969–2011): Ouverture d'ensemble, repli des élites [The evolution of homogamy of diploma, class and social origin in France (1969-–2011): Opening of the whole, withdrawal of the elites]. *Revue Française de Sociologie, 55,* 459–505.

Breen, R., & Andersen, S. H. (2012). Educational assortative mating and income inequality in Denmark. *Demography, 49,* 867–887.

Breen, R., & Salazar, L. (2010). Has increased women's educational attainment led to greater earnings inequality in the United Kingdom? A multivariate decomposition analysis. *European Sociological Review, 26,* 143–157.

Brinton, M. C., Mun, E., & Hertog, E. (2021). Singlehood in contemporary Japan: Rating, dating, and waiting for a good match. *Demographic Research, 44,* 239–276. https://doi.org/10.4054/DemRes.2021.44.10

Burtless, G. (1999). Effects of growing wage disparities and changing family composition on the U.S. income distribution. *European Economic Review, 43,* 853–865.

Cellini, S. R., & Turner, N. (2019). Gainfully employed?: Assessing the employment and earnings of for-profit college students using administrative data. *Journal of Human Resources, 54,* 342–370.

Collins, R. (1979). *The credential society: An historical sociology of education and stratification*. New York, NY: Academic Press.

Deming, D. J., Goldin, C., & Katz, L. F. (2012). The for-profit postsecondary school sector: Nimble critters or agile predators? *Journal of Economic Perspectives, 26*(1), 139–164.

DiPrete, T. A., & Buchmann, C. (2013). *The rise of women: The growing gender gap in education and what it means for American schools*. New York, NY: Russell Sage Foundation.

Edwards, L. N., & Pasquale, M. K. (2003). Women's higher education in Japan: Family background, economic factors, and the equal employment opportunity. *Journal of the Japanese and International Economies, 17,* 1–32.

Esping-Andersen, G. (2007). Sociological explanations of changing income distributions. *American Behavioral Scientist, 50,* 639–658.

Esteve, A., Garcia-Roman, J., & Permanyer, I. (2012). The gender-gap reversal in education and its effect on union formation: The end of hypergamy? *Population and Development Review, 38,* 535–546.

Esteve, A., Schwartz, C. R., Van Bavel, J., Permanyer, I., Klesment, M., & Garcia-Roman, J. (2016). The end of hypergamy: Global trends and implications. *Population and Development Review, 42,* 615–625.

Feng, A. J. (2022). Revisiting horizontal stratification in higher education: College prestige hierarchy and educational assortative mating in China. *Demography, 59,* 349–369. https://doi.org/10.1215/00703370-9656369

Fujihara, S., & Uchikoshi, F. (2019). Declining association with persistent gender asymmetric structure: Patterns and trends in educational assortative marriage in Japan, 1950–1979. *Research in Social Stratification and Mobility, 60,* 66–77.

Fukuda, S., Raymo, J. M., & Yoda, S. (2020). Revisiting the educational gradient in marriage in Japan. *Journal of Marriage and Family, 82,* 1378–1396.
Fukuda, S., Yoda, S., & Mogi, R. (2021). Educational assortative mating in Japan: Evidence from the 1980–2010 census. *Journal of Population Studies, 57,* 1–20.
Gerber, T. P., & Cheung, S. Y. (2008). Horizontal stratification in postsecondary education: Forms, explanations, and implications. *Annual Review of Sociology, 34,* 299–318.
Goldin, C., & Katz, L. F. (2009). *The race between education and technology*. Cambridge, MA: Harvard University Press.
Han, H. (2010). Trends in educational assortative marriage in China from 1970 to 2000. *Demographic Research, 22,* 733–770. https://doi.org/10.4054/DemRes.2010.22.24
Hersch, J. (2013). Opting out among women with elite education. *Review of Economics of the Household, 11,* 469–506.
Hout, M., & DiPrete, T. A. (2006). What we have learned: RC28's contributions to knowledge about social stratification. *Research in Social Stratification and Mobility, 24,* 1–20.
Hoxby, C. M. (2009). The changing selectivity of American colleges. *Journal of Economic Perspectives, 23*(4), 95–118.
Hu, A., & Qian, Z. (2015). Educational homogamy and earnings inequality of married couples: Urban China, 1988–2007. *Research in Social Stratification and Mobility, 40,* 1–15.
Ishida, H. (1998). Educational credentials and labour-market entry outcomes in Japan. In Y. Shavit & W. Muller (Eds.), *From school to work: A comparative study of educational qualifications and occupational destinations* (pp. 287–309). Oxford. UK: Clarendon Press.
Ishida, H. (2007). Japan: Educational expansion and inequality in access to higher education. In Y. Shavit, R. Arum, & A. Gamoran (Eds.), *Stratification in higher education: A comparative study* (pp. 63–86). Stanford, CA: Stanford University Press.
Ishii, K., & Nozaki, H. (2014). Constructing longitudinal and cross-sectional weights in KHPS and JHPS. *Mita Business Review, 57*(4), 123–145. (in Japanese)
Kalmijn, M. (1998). Intermarriage and homogamy: Causes, patterns, trends. *Annual Review of Sociology, 24,* 395–421.
Katrňák, T., & Manea, B. C. (2020). Change in prevalence or preference? Trends in educational homogamy in six European countries in a time of educational expansion. *Social Science Research, 91,* 102460. https://doi.org/10.1016/j.ssresearch.2020.102460
Kawaguchi, D., & Mori, Y. (2016). Why has wage inequality evolved so differently between Japan and the U.S.? The role of the supply of college-educated workers. *Economics of Education Review, 52,* 29–50.
Leesch, J., & Skopek, J. (2022, April). *Decomposing trends in educational homogamy and heterogamy: The case of Ireland*. Paper presented at the RC28 spring meeting, London School of Economics, London, UK.
Lichter, D. T., & Qian, Z. (2019). The study of assortative mating: Theory, data, and analysis. In R. Schoen (Ed.), *Springer series on demographic methods and population: Vol. 47. Analytical family demography* (pp. 303–337). Cham, Switzerland: Springer International Publishing. https://doi.org/10.1007/978-3-319-93227-9_13
Logan, J. A. (1996). Rules of access and shifts in demand: A comparison of log-linear and two-sided logit models. *Social Science Research, 25,* 174–199.
Lucas, S. R. (2001). Effectively maintained inequality: Education transitions, track mobility, and social background effects. *American Journal of Sociology, 106,* 1642–1690.
Mare, R. D. (1991). Five decades of educational assortative mating. *American Sociological Review, 56,* 15–32.
Marx, K. (1909). *Capital: A critique of political economy* (Vol. I) (F. Engels, Ed.; S. Moore, Trans.). Chicago, IL: Charles H. Kerr & Company. (Original work published 1867).
Ministry of Education, Culture, Sports, Science and Technology. (2022). *Statistical abstract*. Tokyo, Japan: National Printing Bureau.
Miwa, S. (2007). Long-term trends in status homogamy. In Y. Sato (Ed.), *Deciphering stratification and inequality: Japan and beyond* (pp. 140–160). Melbourne, Australia: Trans Pacific Press.
Naoi, M. (2006). *Residential mobility and panel attrition: Using interviewing process as identifying instruments* (KUMQRP Discussion Paper Series, No. DP2006-031). Tokyo, Japan: Keio University Market Quality Research Project. Retrieved from http://ies.keio.ac.jp/old_project/old/gcoe-econbus/pdf/dp/DP2006-031.pdf

National Center for Education Statistics. (2019). *The condition of education 2019* (NCES Report No. 2019-144). Washington, DC: U.S. Department of Education.
National Institute of Population and Social Security Research. (2017). *Marriage and childbirth in Japan: The Fifteenth Japanese National Fertility Survey, 2015* (Report). Tokyo, Japan: National Institute of Population and Social Security Research. (in Japanese)
Ono, H. (2008). Training the nation's elites: National–private sector differences in Japanese university education. *Research in Social Stratification and Mobility, 26,* 341–356.
Oppenheimer, V. K. (1988). A theory of marriage timing. *American Journal of Sociology, 94,* 563–591.
Parkin, F. (1971). *Class inequality and political order: Social stratification in capitalist and communist societies*. Berkeley: University of California Press.
Raftery, A. E. (1995). Bayesian model selection in social research. *Sociological Methodology, 25,* 111–163.
Rauscher, E. (2015). Effects of early U.S. compulsory schooling laws on educational assortative mating: The importance of context. *Demography, 52,* 1219–1242.
Ravazzini, L., Kuhn, U., & Suter, C. (2017). Do opposites attract? Educational assortative mating and dynamics of wage homogamy in Switzerland, 1992–2014. *Swiss Journal of Sociology, 43,* 567–586.
Raymo, J. M., & Iwasawa, M. (2005). Marriage market mismatches in Japan: An alternative view of the relationship between women's education and marriage. *American Sociological Review, 70,* 801–822.
Raymo, J. M., Park, H., Xie, Y., & Yeung, W. J. (2015). Marriage and family in East Asia: Continuity and change. *Annual Review of Sociology, 41,* 471–492.
Roksa, J., Grodsky, E., Arum, R., & Gamoran, A. (2007). United States: Changes in higher education and social stratification. In Y. Shavit, R. Arum, & A. Gamoran (Eds.), *Stratification in higher education: A comparative study* (pp. 165–191). Stanford, CA: Stanford University Press.
Sakaguchi, N. (2014). Attrition of respondents from Japanese Panel Survey of Consumers. *Japanese Journal of Research on Household Economics, 104,* 34–41. (in Japanese)
Schwartz, C. R. (2010). Earnings inequality and the changing association between spouses' earnings. *American Journal of Sociology, 115,* 1524–1557.
Schwartz, C. R. (2013). Trends and variation in assortative mating: Causes and consequences. *Annual Review of Sociology, 39,* 451–470.
Schwartz, C. R., & Mare, R. D. (2005). Trends in educational assortative marriage from 1940 to 2003. *Demography, 42,* 621–646.
Shen, Y. (2021). The nonlinear linkage between earnings homogamy and earnings inequality among married couples. *Demography, 58,* 527–550. https://doi.org/10.1215/00703370-8996374
Smits, J. (2003). Social closure among the higher educated: Trends in educational homogamy in 55 countries. *Social Science Research, 32,* 251–277.
Smits, J., & Park, H. (2009). Five decades of educational assortative mating in 10 East Asian societies. *Social Forces, 88,* 227–255.
Torche, F. (2010). Educational assortative mating and economic inequality: A comparative analysis of three Latin American countries. *Demography, 47,* 481–502.
Tzeng, J. M. (1992). The effects of socioeconomic heterogamy and changes on marital dissolution for first marriages. *Journal of Marriage and the Family, 54,* 609–619.
Uchikoshi, F. (2018). Assortative mating in the age of marriage decline. *Sociological Theory and Method (Riron to Hoho), 33*(1), 15–31. https://doi.org/10.11218/ojjams.33.15 (in Japanese)
Uchikoshi, F., & Raymo, J. M. (2021). *Educational assortative mating in Japan: Insights into social change and stratification*. Singapore: Springer Nature Singapore.
Van Bavel, J., Schwartz, C. R., & Esteve, A. (2018). The reversal of the gender gap in education and its consequences for family life. *Annual Review of Sociology, 44,* 341–360.
Wong, R. S.-K. (2003). To see or not to see: Another look at research on temporal trends and cross-national differences in educational homogamy. *Taiwanese Journal of Sociology, 31,* 45–88.
Woźny, A. (2022). Herbivorous men, carnivorous women: Doing masculinity and femininity in Japanese "marriage hunting." *Signs: Journal of Women in Culture and Society, 47,* 715–740.
Xie, Y. (1992). The log-multiplicative layer effect model for comparing mobility tables. *American Sociological Review, 57,* 380–395.
Yonezawa, A., Nakatsui, I., & Kobayashi, T. (2002). University rankings in Japan. *Higher Education in Europe, 27,* 373–382.

Fumiya Uchikoshi
uchikoshi@princeton.edu

Department of Sociology and Office of Population Research, Princeton University, Princeton, NJ, USA;
https://orcid.org/0000-0002-4972-4275