Educational and age assortative mating in China:
The importance of marriage order

Yang Hu
Department of Sociology
Lancaster University
Email: yang.hu@lancaster.ac.uk

Yue Qian
Department of Sociology
University of British Columbia
Email: yue.qian@ubc.ca

Author Note

Abstract

Objective: Drawing on the preference-opportunity framework of union formation, we compare patterns of assortative mating on education and age between first marriages and remarriages in contemporary China.

Background: Family change in China is characterized by a decline in first marriages, an increasing divorce rate, and a growing number of remarriages, like in many Western countries. Assortative mating plays a key role in the (re)production of socioeconomic inequality, but research on marital sorting in remarriages remains limited, especially in non-Western contexts.

Method: Our analysis drew on pooled, nationally-representative data from six waves of the Chinese General Social Survey and China Family Panel Studies between 2010 and 2015 ($N = 48,737$ individuals). We used log-linear models to examine educational assortative mating patterns and multinomial logit regressions to analyze age assortative mating patterns.

Results: Educational homogamy was more likely to occur in first marriages than in remarriages. Compared with marrying a similarly-aged spouse, both previously-married men and women were more likely than their never-married counterparts to marry a much older spouse and less likely to marry a much younger spouse.

Conclusion: Our findings suggest that remarriage is incompletely institutionalized in China in that the rules underpinning the systematic pairing of spouses with similar traits in first marriages are less salient in configuring the assortative mating patterns in remarriages. The results highlight the importance of marriage order—as a resource for the never married and a disadvantage for the previously married—in shaping the preference-opportunity structure in the Chinese marriage market.

Keywords: Age, Assortative Mating, Education, Gender, Marriage, Remarriage.

Assortative mating, the question of "who marries whom" has important implications for the production and reproduction of social inequality (Schwartz, 2013). Despite the decline of first marriage and the rise of remarriage in many countries (Cherlin, 2004; Raymo et al., 2015; Wang & Zhou, 2010), scholarly efforts remain limited in examining how marriage order—i.e., first marriages vis-à-vis remarriages—may shape the pattern of assortative mating (for exceptions, see Choi & Tienda, 2017; Gelissen, 2004; Qian & Lichter, 2018; Shafer, 2013a, 2013b). In addition, existing research has predominantly examined marital sorting on social and economic traits such as education, race, and immigrant status, but much less is known about how age may affect assortative mating patterns (for reviews, see Blossfeld, 2009; Kalmijn, 1998; Schwartz, 2013). The institution of marriage is imbued with symbolic meanings beyond mere socio-economic considerations (Cherlin, 2004). Since the availability of potential spouses in the marriage market and individuals' marital behaviors and strategies change over the life course (Hu & To, 2018; Rosenfeld & Thomas, 2012; Qian & Preston, 1993), it is pivotal to also consider the role played by age in shaping marital sorting and how the patterns of age pairing differ between first and higher-order marriages. The comparison of assortative mating in first marriages and remarriages—in the dimensions of education and age—thus promises important and new insights into family changes and broader processes of social stratification.

It is pertinent to compare assortative mating in first and higher-order marriages against the backdrop of unfolding demographic transitions in China (Wang & Zhou, 2010). Annual rates of marriage and divorce (i.e., number of marriages/divorces per 1,000 population) from 1985 to 2016 are shown in Figure 1. The marriage rate had fluctuated in post-reform China and has been in steady decline since 2013. The divorce rate has undergone a nearly eight-fold increase from 0.4 to 3.0 over the same period. Notably, the divorce rate in today's China is comparable to that in Western countries such as the United States, where the

divorce rate was 3.2 in 2016 (National Center for Health Statistics, 2017). In addition, only

3.0% of newly married people in 1985 had previously married, and this has increased

dramatically to 16.3% in 2016 (China Statistics Yearbook, 2017). Clearly, the decline in first

marriage rates and the increase in divorce and remarriage rates have become the

characterizing features of the changing demography of families in contemporary China.

FIGURE 1. RATES OF MARRIAGE AND DIVORCE IN CHINA, 1985–2016.
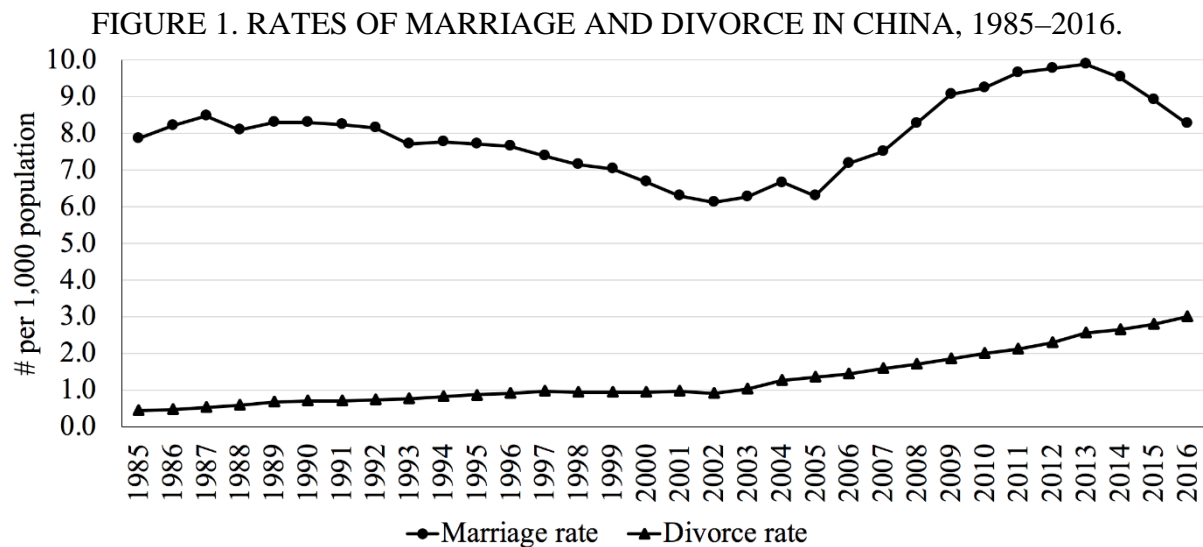
Source: Authors' calculations using data on annual marriage registrations, divorce registrations, and population size from the 2002, 2011, and 2017 China Statistics Yearbooks (accessed from the National Bureau of Statistics of China website on July 14, 2018, http://www.stats.gov.cn/tjsj/ndsj/).

Using pooled data from multiple waves of the Chinese General Social Survey and

China Family Panel Studies between 2010 and 2015, we compared educational and age

assortative mating patterns between first and higher-order marriages. Results showed that

educational homogamy was less likely in remarriages than in first marriages; and age

hypergamy (i.e., marrying older spouses) was more likely to occur among remarried men and

women than among their first-married counterparts. The results suggest that compared with

first marriage, the weaker strength of educational homogamy in remarriage may help mitigate

economic inequality arising from marital sorting on education (Hu & Qian, 2015). The results

also suggest that age is an important resource in mate selection for some but, at the same

time, a detriment to marriage prospects for others. In light of the results, we highlight the

distinct preference-opportunity structures of first and higher-order marriages in China and underline the importance of marriage order for the study of assortative mating.

THEORETICAL CONSIDERATIONS

This research is guided by a preference-opportunity framework. On the one hand, individuals seek to maximize their utility in the marriage market (Becker, 1981). Individual preferences for a "suitable" spouse are informed by the social, economic, and cultural institutions in which the marital institution is embedded (Buss et al., 2001; Cherlin, 2004; Oppenheimer, 1988). On the other hand, individuals' ability to realize their preferences is constrained by structural opportunities that define the pool of potential spouses (Schwartz, 2013). Moreover, individual traits such as socioeconomic status and age may also determine the extent to which people can realize their preferences in the marriage market (Mu & Xie, 2014). It is likely that the preference-opportunity structure for marriage may differ between never-married and previously-married individuals. Remarriage is an "incomplete institution" that is only loosely regulated by rules underlying first marriage (Cherlin, 1978). Because the marital institution provides no "standard solutions" for how family roles and relations should be organized in remarriages (Cherlin, 2004), the systematic pairing of spouses with similar traits may be weaker among remarried couples. Therefore, we expect spouses to be less homogamous with respect to education and age in remarriages than in first marriages.

Educational Assortative Mating

In contemporary China, education has played an increasingly important role in shaping individual preferences and structural opportunities of union formation (Han, 2010; Qian & Qian, 2014). With the reinstatement and expansion of formal schooling and tertiary education following China's 1978 economic reform, education has become a crucial indicator of

people's social status and human capital (Yeung, 2013). In the meantime, gender gaps in all levels of education have narrowed over the past decades (Treiman, 2013). Because educational institutions are potential sites for dating and mating, educational homogamy tends to increase with prolonged schooling (Mare, 1991). Moreover, education also helps homogenize ideological orientations and cultural tastes, which may reinforce preferences for status homogamy (Bruze, 2011). Prior research has indeed documented the presence and rise of educational assortative mating in China (Han, 2010; Qian & Qian, 2014, 2017).

We hypothesize that educational homogamy is less likely in remarriages than in first marriages (*Hypothesis 1*). Individuals tend to prefer marrying similarly-educated spouses (Higgins et al., 2002). However, because divorced and widowed people, usually in middle to late life, face a thin marriage market for potential partners (Rosenfeld & Thomas, 2012), they may cast a wider net when searching for spouses by relaxing their preferences for educational homogamy. Yet further, education may be less relevant in higher-order than first marriages altogether. Although educational institutions serve as a key match-making site for the never married, the previously married are less likely to meet their remarriage partners in schools, given the concentration of remarriages in later life stages (Hu & To, 2018; Shafer, 2013a). Whereas education is often a proxy for long-term economic potential in the first-marriage market, the socioeconomic status of previously-married people is more clearly signalled by their occupation, income and wealth, which renders education a tangential socioeconomic indicator in the remarriage market (Oppenheimer, 1988; Qian, 2017).

Age Assortative Mating

The patterns of age pairing in first and higher-order marriages have received scant scholarly attention (for exceptions, see Gelissen, 2004; Qian & Lichter, 2018; Shafer, 2013a). Unlike socioeconomic resources that confer sought-after status, age is a double-edged sword that

represents both an asset and a liability in the marriage market. Age is indicative of symbolic status and power, especially for men, in the Chinese family, in which patriarchal norms regulate the distribution of power by individuals' age-cum-sex attributes (Hu & Scott, 2016). Since patriarchal traditions oblige men to be the breadwinners and age correlates with the accumulation of economic resources, women tend to marry men who are older than themselves in pursuit of economic stability (Poppel et al., 2001), especially given the resurgence of gender inequality in China's labor market in recent decades (Mu & Xie, 2014). A woman's youth is considered a valuable resource, as the sexualized construction of femininity associates "youthful looks" with physical attractiveness and fecundity in China and elsewhere (England & McClintock, 2009; Ji, 2015).

We expect age homogamy to be less likely in remarriages than in first marriages (*Hypothesis 2*). First, the opportunity structure enforces age homogamy more closely in the first-marriage than in the remarriage market. The cohort-based organization of education fosters marriages between individuals of similar ages (Smits, 2003). Compared with first marriages, the routes through which remarriage partners meet are more diverse (Shafer, 2013b), which may contribute to age heterogamy in remarriages. Second, due to the backlash of previous life events, remarriage opportunities are constrained by the social stigma attached to divorce and widowhood (Hu & To, 2018). In particular, because raising someone else's heir is frowned upon in China, children from previous marriages are often viewed as a "heavy burden" and make remarriage more difficult for both genders (Huang, 2012). Given their weaker bargaining position in the marriage market, divorcé(e)s and widow(er)s may be less likely to fulfil their age preferences for mates, compared to the never married. Moreover, divorcé(e)s and widow(er)s may need to draw on additional resources to compensate for their disadvantage in the marriage market. Indeed, marrying a spouse much older than oneself was found to be a key compensatory strategy, particularly for women (Poppel et al., 2001).

METHODS

Data and Sample

Data on remarriage are very limited in Chinese surveys. To ensure a sufficient number of remarriages, we pooled data from two national surveys. Our first data source is the Chinese General Social Survey (CGSS: http://cgss.ruc.edu.cn), a repeated cross-sectional survey conducted by the National Survey Research Center at Renmin University of China. Using a multistage stratified random sampling strategy, the CGSS surveyed one random member aged 18 and above from each household, with response rates of about 72% for the years we used. We used data from the 2011, 2012, 2013 and 2015 CGSS (N = 5,620, 11,765, 11,438 and 10,968 for each year), because they collected information on respondents' marriage order. Our second data source was the adult panel from the 2010 and 2012 waves of the China Family Panel Studies (CFPS: http://www.isss.pku.edu.cn/cfps/en), a longitudinal household panel survey newly launched by Peking University (Xie & Hu, 2014). Multistage probability-proportional-to-size sampling was used; and the household-level response rate was 81.25% for the 2010 baseline. Although the CFPS is a longitudinal survey, few respondents changed marital status between the 2 waves. Thus, we used the cross-sectional samples of the 2010 respondents (N = 33,600) and the new respondents in 2012 (N = 9,326).

To construct our analytical sample, we kept currently married respondents (N = 56,081)—the only group who provided spousal information. We further restricted our sample based on two criteria: (a) respondents were born after the founding of the People's Republic of China (i.e., 1950 or later), which means the upper age limit of our sample was 65 years, thereby minimizing mortality selection bias; and (b) both spouses were aged 16 years and older when they entered the current marriage. After excluding 92 respondents with missing information on the variables used in our analysis, we obtained a final analytical sample of 48,737 respondents (N = 24,644 for CGSS and 24,093 for CFPS).

Variables

Our key variable of interest is marriage order—a binary variable distinguishing first (reference category) and higher-order marriages. Unfortunately, our data did not contain any information on whether the respondents' spouses were in their first or higher-order marriages. Thus, our classification of "first marriage" and "remarriage" was based on the marital order of the respondents, irrespective of that of their spouses. Since mixed-order marriage contains one remarried spouse, remarriage was under-represented in our sample.

Married respondents were asked about their own and their spouses' educational attainment at the time of survey—a good proxy for education at the time of marriage, because only rarely do Chinese people pursue further formal education after getting married (Yeung, 2013). The educational measure contained four categories: primary school or below, junior high school, senior high school, and college or above (including vocational college [*da zhuan*], four-year university, and advanced degrees). We did not further distinguish university graduates from vocational college graduates due to small sample sizes.

Based on the year of current marriage and respondents' own and their spouses' year of birth, we calculated the age at current marriage for both spouses. Following prior research (Verbakel & Kalmijn, 2014), we grouped the husband-wife age gap, which ranged between −34 and 34, into five categories: husband younger than wife by 3 or more years ([–34, –3]), husband-wife age difference within 2 years ([–2, 2]), husband older than wife by 3 to 5 years ([3, 5]), husband older than wife by 6 to 10 years ([6, 10]), and husband older than wife by 11 or more years ([11, 34]). Among the respondents in the category of –34 to –3 (husband younger than wife by 3 or more years), 56% had a husband-wife age gap of –3 years, and another 22% and 9%, respectively, had an age gap of –4 and –5 years, whereas the husband-wife gap of –34 represented only one extreme case in our sample. Due to cell size considerations, we did not further differentiate within the husband-wife age gap of –34 to –3.

We controlled for the combination of data source and survey year (referred to as data source hereafter for brevity) through six dummy variables: 2011 CGSS (reference), 2012 CGSS, 2013 CGSS, 2015 CGSS, 2010 CFPS, and 2012 CFPS. We also included a dummy variable indicating urban residence (=1; rural = 0) in the age assortative mating analysis.

Analytical Strategies

Educational assortative mating: log-linear models

We used log-linear models to examine educational assortative mating patterns. The models controlled for gender differences in the marginal distribution of education, which allowed us to identify assortative mating patterns net of the effects of population structure (Kalmijn, 2010). As the log-linear analysis took place at the couple level and in some cases both spouses were interviewed in the CFPS, we first prepared our data by randomly selecting one spouse from each couple where both spouses were interviewed. As a result, we constructed 39,928 unique dyadic records of respondents' and their spouses' educational levels. We then produced a four-way table with 192 cells, cross-tabulating husband's education (4 levels), wife's education (4 levels), data sources (6 levels), and marriage order (2 levels). Only less than 4% of the cells (7 out of 192) were empty. Our baseline model is as follows:

$$\log\mu_{ijms} = \lambda + \lambda_{im}^{HEM} + \lambda_{jm}^{WEM} + \lambda_{is}^{HES} + \lambda_{js}^{WES} \qquad [1]$$

where *HE* denotes husband's education (i = 1, 2, 3, 4), *WE* denotes wife's education (j = 1, 2, 3, 4), *M* represents marriage order (m = 1, 2), and *S* represents data source (s = 1, 2, …, 6). μ_{ijms} is the expected number of marriages from data source *s*, with marriage order equal to *m*, contracted between husband in category *i* and wife in category *j* of education. The model accounts for the marginal distributions of husbands' and wives' education by marriage order and data source, as well as all other lower-order terms, but assumes no association between husband's and wife's education. We did not include the interaction terms between marriage

order and data source, because supplementary analysis (available upon request) revealed that the odds of remarriage did not vary significantly across data sources.

In Model 2, we added an educational homogamy parameter to the cells on the main diagonal of education, as specified in Equation [2], where γ_{ij}^{O} denotes the parameter estimate for the overall strength of educational homogamy ($O = 1$ when $i = j$ and $O = 0$ otherwise). We further included an interaction term between educational homogamy and marriage order in Model 3, as specified in Equation [3], in which the difference in the degree of educational homogamy between first marriages and remarriages was captured by $\gamma_{ij}^{O}\lambda_{m}^{M}$.

$$\log\mu_{ijms} = \text{Equation}[1] + \gamma_{ij}^{O} \qquad [2]$$

$$\log\mu_{ijms} = \text{Equation}[1] + \gamma_{ij}^{O}\lambda_{m}^{M} \qquad [3]$$

$$\log\mu_{ijms} = \text{Equation}[1] + \delta_{ij}^{E}\lambda_{m}^{M} \qquad [4]$$

Because the degree of educational homogamy may vary across educational levels (Han, 2010), we allowed the main diagonal parameter to vary by the four levels of education in Model 4. As denoted in Equation [4], δ_{ij}^{E} represents a set of homogamy parameters for each level of education ($E = 1$ when $i = j = 1$, …, $E = 4$ when $i = j = 4$, and $E = 0$ otherwise). Moreover, it may become more difficult for two individuals to get married as the difference in their educational levels increases (Qian, 1997). In Model 5, we used distance parameters to model educational assortative mating, as denoted in Equation [5]. φ_{ij}^{D} represents a set of distance parameters ($D = |i - j|$ ranging from 0 to 3; three dummy variables were created with $i = j$ as the reference category). Thus, $\varphi_{ij}^{D}\lambda_{m}^{M}$ captures differences in the likelihood of crossing educational boundaries between first marriages and remarriages.

$$\log\mu_{ijms} = \text{Equation}[1] + \varphi_{ij}^{D}\lambda_{m}^{M} \qquad [5]$$

Age assortative mating: Multinomial logit regression models

We used multinomial logit regression models to examine age assortative mating patterns, separately for women and men. The models estimated the relative likelihood of an individual falling into a given spousal age gap as opposed to age homogamy (i.e., husband-wife age gap between –2 and 2). As it was possible for multiple CFPS respondents to cluster in the same household, we estimated cluster-robust standard errors to account for within-household correlation (Cameron & Miller, 2015). Unlike prior research that classified spouses' ages into 5-year intervals and used log-linear models to examine age assortative mating (e.g., Gelissen, 2004; Qian, 1998; Qian & Qian, 2014), we chose to directly analyze spousal age gaps (for example, see Verbakel & Kalmijn, 2014). Because 75% of the respondents had a husband-wife age gap between –3 and 3 years, using age intervals would substantially increase the misclassification rate of age pairing.

RESULTS

Educational Assortative Mating

Table 1 presents the marginal distributions of spouses' education, by marriage order. The results are in line with Hypothesis 1 in that educational homogamy was less common in remarriages than in first marriages. The percentages of couples in which both spouses had a junior high school education, high school education, or tertiary education were smaller in remarriages than in first marriages (15.46% vs. 18.46%; 5.71% vs. 7.27%; 4.46% vs. 8.21%, respectively). According to the column and row totals, husbands and wives in remarriages were less educated than their counterparts in first marriages. This is not surprising as people in remarriages tend to be older than those in first marriages and China's mass expansion of education was relatively recent (Treiman, 2013). Thus, it is important to examine assortative mating patterns net of the marginal distributions of spouses' education (Kalmijn, 2010).

Table 1. *Percentage distribution of husband's and wife's educational attainment, by marriage order*

Husband's education	Wife's education				
	< junior high school	Junior high school	High school	College or above	Total
First marriage					
< junior high school	22.23	5.13	0.85	0.08	28.30
Junior high school	14.63	18.46	4.32	0.80	38.20
High school	3.84	6.80	7.27	1.95	19.86
College or above	0.50	1.56	3.37	8.21	13.65
Total	41.21	31.94	15.81	11.04	100.00
Remarriage					
< junior high school	26.56	6.54	1.76	0.52	35.37
Junior high school	13.07	15.46	6.54	1.45	36.51
High school	3.42	7.57	5.71	1.66	18.36
College or above	0.62	1.56	3.11	4.46	9.75
Total	43.67	31.12	17.12	8.09	100.00

Note. *N* (First marriage) = 38,964; *N* (Remarriage) = 964. Chi-square tests indicated that husbands' and wives' marginal distributions of education significantly differed by marriage order. Column and row percentages may not add up to 100% due to rounding.

Table 2 presents the log-linear results of educational assortative mating for the key parameters and model fit indices (i.e., Bayesian information criterion [BIC]) (full results available upon request). A smaller value of BIC indicates a better and more parsimonious model fit (Raftery, 1986). Our baseline Model 1 assumed no association between husband's and wife's education; and not surprisingly, the BIC was much greater than zero, indicating a poor model fit. In Model 2, adding a homogamy parameter along the main diagonal substantially reduced the BIC, suggesting a strong tendency for Chinese people to marry within their educational groups. In Model 3, we included an interaction term between educational homogamy and marriage order. The further reduction of the BIC from Model 2 to Model 3 indicates a significant variation in the likelihood of educational homogamy with marriage order. Instead of having a unified parameter for educational homogamy, we allowed the homogamy parameter to vary across educational levels in Model 4, which further reduced the BIC. In Model 5, our best fitting model with a negative BIC, we used distance parameters to estimate how the odds of crossing a given number of educational levels relative to the odds of educational homogamy differed between first marriages and remarriages.

Table 2. *Select parameter estimates from log-linear models of educational assortative mating*

|	(M1) Baseline	(M2) M1 + O	(M3) M2 + OR	(M4) M1 + MR	(M5) M1 + DR
Remarriage (ref. = First marriage)	–3.424***	–3.484***	–3.278***	–3.573***	–3.582***
	(0.066)	(0.058)	(0.075)	(0.159)	(0.062)
Homogamy		1.278***	1.285***		
		(0.011)	(0.011)		
Homogamy × remarriage			–0.298***		
			(0.069)		
Both < junior high school				1.953***	
				(0.030)	
Both junior high school				0.141***	
				(0.027)	
Both high school				1.028***	
				(0.032)	
Both college or above				3.388***	
				(0.042)	
Both < junior high school × remarriage				0.052	
				(0.172)	
Both junior high school × remarriage				–0.304	
				(0.169)	
Both high school × remarriage				–0.453*	
				(0.207)	
Both college or above × remarriage				–0.721**	
				(0.277)	
Distance = 1					–0.867***
					(0.012)
Distance = 2					–2.121***
					(0.022)
Distance = 3					–4.147***
					(0.069)
(Distance = 1) × remarriage					0.231**
					(0.073)
(Distance = 2) × remarriage					0.460***
					(0.127)
(Distance = 3) × remarriage					1.211***
					(0.323)
df	143	142	141	135	137
BIC	21,270	7,260	7,252	2,677	–931

Note. $N = 39{,}928$ couples; number of cells = 192. Ref. = reference group. Model terms (number of parameters): O = homogamy (1); R = remarriage indicator (1); M = main diagonal parameters (4); D = distance parameters (3). Standard errors are in parentheses.
***$p < 0.001$, **$p < 0.01$, *$p < 0.05$.

While model selection is not our main focus, we capitalize on the parameter estimates

from Models 3 to 5. To aid the interpretation, we visualize our results in Figure 2, in which

the lighter bars denote first marriage and the darker bars denote remarriage. The results

depicted in Panel A of Figure 2 support Hypothesis 1. In first marriages, people were 3.61

times more likely to marry a spouse who had the same rather than a different level of

education (exp(1.285), $p < 0.001$). By contrast, the odds of educational homogamy were only

2.68 times greater than the odds of educational heterogamy in remarriages (exp(1.285–

0.298), $p < 0.001$). The likelihood of educational homogamy was significantly lower in

remarriages than in first marriages ($b = –0.298$, $p < 0.001$).

FIGURE 2. ODDS OF EDUCATIONAL HOMOGAMY AND HETEROGAMY, BY
MARRIAGE ORDER
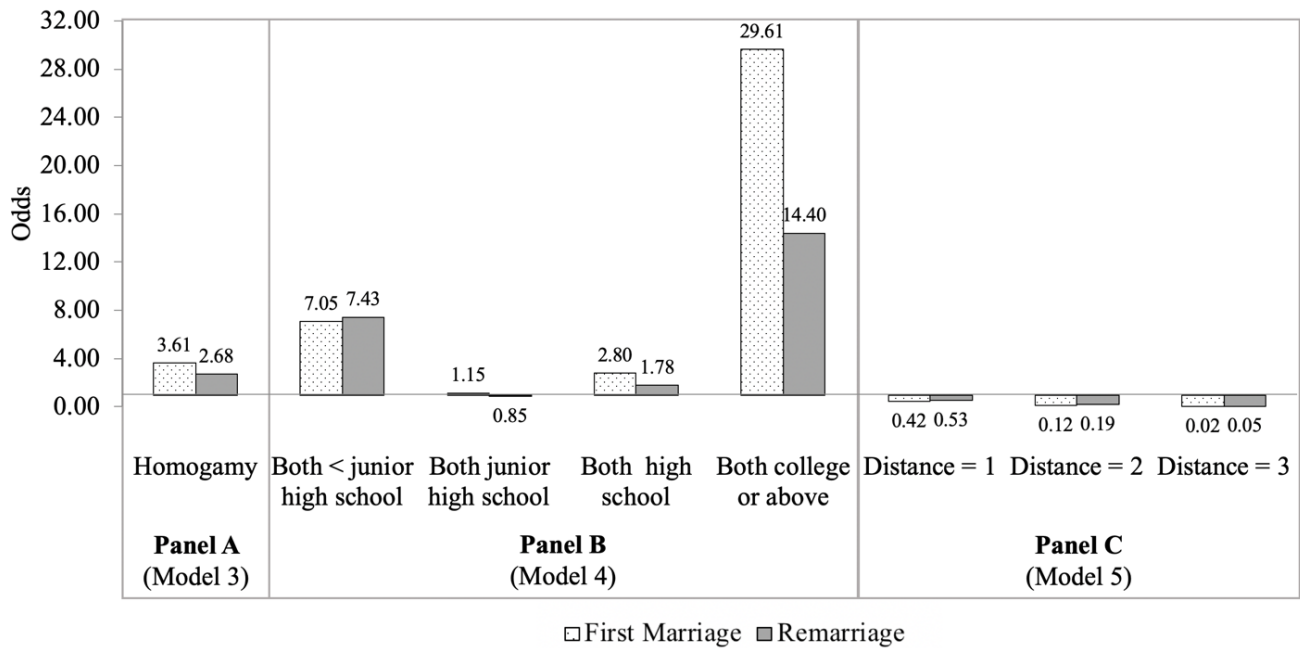
Panel B of Figure 2 shows that when the odds of homogamy were allowed to vary by

educational level, educational homogamy in which both spouses had high school education or

above was significantly more likely to occur in first than in higher-order marriages. The

greatest difference was noted among the college-educated: The odds of educational

homogamy involving two college-educated spouses were almost 30 times higher than the

odds of educational heterogamy in first marriages (exp(3.388), $p < 0.001$). By contrast, the

corresponding figure was only 14 times in remarriages (exp(3.388−0.721), $p < 0.001$).

Panel C of Figure 2 depicts the results based on distance parameters in Model 5.

Compared with marrying within their educational groups, individuals in first marriages were

42% as likely to marry a spouse whose educational attainment differed from their own by one

level (exp(–0.867), $p < 0.001$), whereas those in remarriages were 53% as likely to do so

(exp(–0.867 + 0.231), $p < 0.001$). In general, individuals were highly unlikely to marry

spouses with substantially different levels of education (i.e., two or three levels of

difference). Nevertheless, relative to educational homogamy, the likelihood of educational

heterogamy crossing two or three levels of difference was still significantly higher in

remarriages than in first marriages (two-level difference: 19% in remarriage vs. 12% in first

marriage; three-level difference: 5% in remarriage vs. 2% in first marriage).

Taken together, our three specifications of educational assortative mating parameters

consistently supported Hypothesis 1 in indicating that the degree to which individuals marry

outside their own educational groups was higher in higher-order than in first marriages.

Age Assortative Mating

Table 3 describes the key variables used in the analysis of age pairing, by the respondents'

gender and marriage order. For both women and men, the mean age gap was larger in

remarriages than in first marriages. On average, remarried men were 4.58 years older than

their wives, and the corresponding age gap was 1.72 years for first-married men ($t = 21.81$, p

< 0.001). Similarly, on average, remarried and first-married women were younger than their

husbands by 3.2 years and 1.95 years, respectively ($t = 9.94$, $p < 0.001$).

After recoding the husband-wife age gap measure into five categories, we found that

consistent with Hypothesis 2, the percentage of age homogamy (i.e., [–2, 2]) was much

higher in first marriages than in remarriages, for both men (63.73% vs. 33.15%) and women

(61.67% vs. 36.92%). In contrast, large spousal age gaps were more prevalent in higher-order

than in first marriages. For example, the proportion of remarried men who were older than

their wives by 11 to 34 years (15.08%) was 14 times larger than that of first-married men

(1.06%).

Table 3. *Descriptive statistics for variables used in the analysis of age assortative mating, by marriage order and gender*

	Men		Women	
	First marriage	Remarriage	First marriage	Remarriage
Husband-wife age gap	1.72	4.58	1.95	3.20
	(2.91)	(5.52)	(3.14)	(5.70)
Husband-wife age gap categories (%)				
[–34, –3]	3.79	6.33	3.29	12.15
[-2, 2]	63.73	33.15	61.67	36.92
[3, 5]	23.68	20.30	24.67	21.50
[6, 10]	7.74	25.14	8.86	19.31
[11, 34]	1.06	15.08	1.51	10.12
Age at marriage	24.49	37.29	22.64	35.26
	(3.68)	(8.77)	(3.14)	(7.80)
Urban (%)	52.31	63.50	52.20	53.58
N (individuals)	22,637	537	24,921	642

Note. Age gap was calculated by subtracting wife's age from husband's age. N = 48,737 [N (2011 CGSS) = 3,570; N (2012 CGSS) = 7,432; N (2013 CGSS) = 7,189; N (2015 CGSS) = 6,453; N (2010 CFPS) = 20,062; N (2012 CFPS) = 4,031]. Standard deviations are in parentheses.

Our results also confirm that first marriages and remarriages tended to take place at different life-course stages. For men, the average age at first marriage was around 24 years, whereas the mean age at remarriage was 37 years. Women's mean ages at first marriage and remarriage were 23 years and 35 years, respectively. As spousal age gap may vary by marital timing (England & McClintock, 2009), it is crucial to control for age at marriage in order to estimate the net association between marriage order and age-gap categories.

In Table 4, we present the results of age assortative mating from multinomial logit regression models. The results supported Hypothesis 2 that age homogamy was less likely in remarriages than in first marriages. Compared with marrying a similarly-aged spouse (i.e., the husband-wife age gap between –2 and 2), previously-married men were more likely than never-married men to marry a much older wife and less likely to marry a much younger wife. Holding constant age at marriage, urban/rural area, and data source, the odds for remarried men to marry an older wife, relative to age homogamy, were 5 times higher than the odds for first-married men to do so (exp(1.695), $p < 0.001$). Although the descriptive results in Table 3 showed that a higher proportion of remarried than first-married men married a wife who was younger by 6 or more years, the results from the multinomial logit models showed the

opposite. Compared with age homogamy, remarried men were 47% (1 – exp(–0.628)), 52% (1 – exp(–0.724)), and 65% (1 – exp(–1.064)) less likely than first-married men to be older than their wives by 3–5 years, 6–10 years, and 11–34 years, respectively. This was in part because we controlled for age at marriage in our regression models. It is important to examine age pairing net of age at marriage because men tend to marry further down in age when they marry later (England & McClintock, 2009), and remarriages tend to take place much later in life than first marriages. We will elaborate on the implications of this finding in the discussion section.

Table 4. *Multinomial logit regression results of age assortative mating, by gender*

	Husband younger than wife	Husband older than wife		
	Age gap [–34, –3] (ref. = [–2, 2])	Age gap [3, 5] (ref. = [–2, 2])	Age gap [6, 10] (ref. = [–2, 2])	Age gap [11, 34] (ref. = [–2, 2])
Men				
Remarriage (ref. = First marriage)	1.695*** (0.289)	–0.628*** (0.163)	–0.724*** (0.183)	–1.064*** (0.247)
Age at marriage	–0.087*** (0.013)	0.163*** (0.008)	0.376*** (0.009)	0.639*** (0.025)
Squared age at marriage	0.005*** (0.001)	–0.010*** (0.001)	–0.019*** (0.001)	–0.023*** (0.002)
Urban	0.033 (0.076)	–0.432*** (0.035)	–1.042*** (0.060)	–1.145*** (0.146)
Constant	–3.791*** (0.192)	0.465*** (0.075)	0.402** (0.124)	–1.506*** (0.270)
Women				
Remarriage (ref. = First marriage)	–0.481* (0.197)	0.999*** (0.159)	2.131*** (0.186)	3.282*** (0.268)
Age at marriage	0.215*** (0.011)	–0.055*** (0.010)	–0.075*** (0.012)	–0.079*** (0.017)
Squared age at marriage	–0.009*** (0.001)	0.008*** (0.001)	0.010*** (0.001)	0.010*** (0.001)
Urban	–0.914*** (0.078)	0.329*** (0.032)	0.156*** (0.047)	0.361*** (0.103)
Constant	–0.932*** (0.153)	–2.048*** (0.078)	–3.441*** (0.119)	–5.185*** (0.259)

Note. ref. = reference group. Robust standard errors are in parentheses. Age at marriage was centered at 30 years. Both models controlled for dummy indicators of data source; for brevity, we do not present their coefficients here, but full models are available upon request.
***$p < 0.001$, **$p < 0.01$, *$p < 0.05$.

Compared with those marrying a similarly-aged husband, previously-married women were more likely than never-married women to be paired with an older husband, but less

likely than the latter to marry a younger husband. Holding constant the control variables, the odds of remarried women marrying a younger husband by 3 years or more, relative to age homogamy, were 38% lower than the odds of first-married women doing so ($1 - \exp(-0.481)$, $p < 0.05$). Conversely, compared with age homogamy, the odds of remarried women marrying an older husband by 3–5 years, 6–10 years, and 11 years or more were 2.7 times ($\exp(0.999)$), 8.4 times ($\exp(2.131)$) and 26.6 times ($\exp(3.282)$), respectively, higher than the corresponding odds for first-married women (for all three, $p < 0.001$).

DISCUSSION

The rapid and sizable increase in the number of remarriages has become a characterizing feature of the familial institution and demographic transition in contemporary China (Wang & Zhou, 2010). However, little is known about assortative mating patterns in remarriage or how the patterns may differ from those observed in first marriage. As a result, a number of important questions are left unanswered. Is remarriage an "incomplete" institution that is regulated to a lesser extent by the rules underlying first marriages in China, as posited by Cherlin when theorizing about American families (1978, 2004)? Does assortative mating in remarriage mitigate social inequality by enabling individuals to cross social boundaries or exacerbate inequality by reinforcing socioeconomic segregation over and above first marriages? Analyzing up-to-date data from nationally representative surveys in China, we have answered these questions by comparing assortative mating with respect to education and age between first and higher-order marriages.

Our results reflect critically on the construct of marriage as a social institution. We found that in China, both educational and age homogamy were weaker in remarriages than in first marriages, which was consistent with prior research situated in Western countries (Qian & Lichter, 2018; Shehan et al., 1991). Although Cherlin's argument (1978, 2004) that

remarriage is an "incomplete" institution applied mainly to differential behaviors and family interactions within first marriages and remarriages, our findings complement this argument by showing that remarriage is also incompletely institutionalized because the rules and norms that regulate mate selection in first marriage are less salient in configuring assortative mating patterns in remarriage. Additionally, we demonstrate that the differential assortative mating patterns by marriage order also differed between the education and age dimensions. While the pattern of educational pairing was more *diverse* in remarriages than in first marriages, people were *uniformly* more likely to marry an older spouse in remarriages than in first marriages. Thus, the results underscore the importance of considering assortative mating as plural processes in which the preference-opportunity structure that shapes assortative mating patterns operates along multiple dimensions.

This research offers new insights into the role played by the education institutions in shaping mate selection and social inequality in China. Our results suggest that educational institution (i.e., site for match-making) and individual life course (i.e., marital timing) jointly shape assortative mating patterns in first and higher-order marriages. As many previously-married people were in later life stages, it was unlikely that they met their remarriage partners in schools (Mare, 1991). Whilst education signifies economic potential in the first-marriage market, individuals' socioeconomic status may be more evident from their occupation, income and wealth rather than education in the remarriage market (Shafer, 2013b). Moreover, since previously-married people tend to face a more limited pool of available partners, they often have to cast a wider net to secure a remarriage partner (Qian & Lichter, 2018). Indeed, we found that individuals were more likely to marry outside their own educational groups in remarriages than in first marriages. With the rise of remarriages in China (Wang & Zhou, 2010), more people may marry across educational boundaries, which may help reduce the social distance between educational groups and mitigate economic inequality arising from

educational assortative mating (Choi & Tienda, 2017; Hu & Qian, 2015).

Our findings suggest that marital sorting on age may have different operative mechanisms in first and higher-order marriages. In line with previous research, we found age homogamy to be prevalent in first marriages (Qian & Qian, 2014). Prior research also showed that men tended to marry further down in age later in the life course, largely due to their preference for youth and the gendered double standard of aging (England & McClintock, 2009; Gelissen, 2004). We advance this observation by noting that the tendency for previously-married men to marry down in age may be an artifact of remarriages occurring at older ages. We found that net of age at marriage, previously-married men were less likely than never-married men to marry a much younger wife but more likely to marry an older wife. Marital history may play a crucial role in determining the degree to which men can fulfill their preference for a young wife, as the negative stigmatization of marital dissolution inhibits previously-married men from finding a younger wife to marry. Similarly, previously-married women are disadvantaged relative to their never-married counterparts, due to the social stigma attached to divorce and widowhood (Hu & To, 2018). Women's young age relative to that of their potential husbands is a valuable resource in the marriage market (England & McClintock, 2009). Therefore, not surprisingly, previously-married women were particularly likely to marry much older men in remarriage, perhaps to compensate for their unfavorable marital history. Taken together, our results suggest that marriage order can be a resource for the never married and a disadvantage for the previously married. Therefore, the normative values and social stigma attached to marital history play an influential role in shaping assortative mating patterns.

This study is subject to several limitations. First, due to the lack of data on spouses' marriage order, we were unable to distinguish mixed-order marriages. This prevented us from testing whether never-married people may exchange their marriage order (i.e., the status of

being never married) for favorable socioeconomic resources when marrying a previously-married spouse, as Qian and Lichter (2018) reported in their study of American couples. Second, divorce and widowhood entail different relational dynamics with children and spouse from previous marriages (Cherlin, 1978; Hu & To, 2018). Due to data limitations, we were not able to differentiate between the two distinct pathways leading into remarriage, but this should be a key agenda for future research. Third, due to a lack of detailed information on spouses' traits at the time of marriage, our analysis necessarily focused on less time-sensitive traits such as education and spousal age gap. Lastly, our analysis compared assortative mating patterns between first-married and remarried populations, but not between the first and higher-order marriages experienced by the same individuals.

This is the first study that has compared assortative mating patterns between first marriages and remarriages in China. Given that a rising number of remarriages has become a major feature of family and demographic change in both the East and the West (Cherlin, 2004; Raymo et al., 2015; Wang & Zhou, 2010), we highlight the need for systematic theoretical developments and further empirical research to better understand the distinctive nature of remarriage. Due to the scarcity of fine-grained data on remarried people, our empirical investigation had to rely on the efforts of pooling six waves of data from two large-scale national surveys. It is pivotal to collect rich longitudinal data from large samples of remarried couples in China. Such data will allow us to follow people through distinct life course trajectories and marital histories and also to examine the ways in which a broader range of attributes such as income, *hukou* status, and occupation shape the preference-opportunity structure of remarriage.

REFERENCES

Becker, G. S. (1981). *A treatise on the family*. Cambridge, MA: Harvard University Press.

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

Bruze, G. (2011). Marriage choices of movie stars: Does spouse's education matter? *Journal of Human Capital, 5*(1), 1-28.

Buss, D. M., Shackelford, T. K., Kirkpatrick, L. A., & Larsen, R. J. (2001). A half century of mate preferences: The cultural evolution of values. *Journal of Marriage and Family*, *63*(2), 491–503.

Cameron, A. C., & Miller, D. L. (2015). A practitioner's guide to cluster-robust inference. *Journal of Human Resources*, *50*(2), 317–372.

Cherlin, A. (1978). Remarriage as an incomplete institution. *American Journal of Sociology*, *84*(3), 634–650.

Cherlin, A. J. (2004). The deinstitutionalization of American marriage. *Journal of Marriage and Family*, *66*(4), 848–861.

China Statistics Yearbook. (2017). Table 22–25: Marriage services statistics. Accessed online on July 21, 2018: http://www.stats.gov.cn/tjsj/ndsj/2017/indexch.htm

Choi, K. H., & Tienda, M. (2017). Boundary crossing in first marriage and remarriage. *Social Science Research*, *62*, 305–316.

England, P., & McClintock, E. A. (2009). The gendered double standard of aging in US marriage markets. *Population and Development Review*, 35(4), 797–816.

Gelissen, J. (2004). Assortative mating after divorce: A test of two competing hypotheses using marginal models. *Social Science Research*, *33*(3), 361–384.

Han, H. (2010). Trends in educational assortative marriage in China from 1970 to 2000. *Demographic Research*, *22*, 733–770.

Higgins, L. T., Zheng, M., Liu, Y., & Sun, C. H. (2002). Attitudes to marriage and sexual behaviors: A survey of gender and culture differences in China and United Kingdom. *Sex Roles*, *46*(3–4), 75–89.

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.

Hu, Y., & To, S. (2018). Family relations and remarriage post-divorce and post-widowhood in China. *Journal of Family Issues*, *39*(8), 2286–2310.

Hu, Y., & Scott, J. (2016). Family and gender values in China: Generational, geographic, and gender differences. *Journal of Family Issues*, *37*(9), 1267–1293.

Huang, Y. (2012). Remarriage, gender, and life course in contemporary inland rural China. *Journal of Comparative Family Studies*, *43*(2), 313–330.

Ji, Y. (2015). Between tradition and modernity: "Leftover" women in Shanghai. *Journal of Marriage and Family*, *77*(5), 1057–1073.

Kalmijn, M. (1998). Intermarriage and homogamy: Causes, patterns, trends. *Annual Review of Sociology*, *24*, 395–421.

Kalmijn, M. (2010). Educational inequality, homogamy, and status exchange in black-white intermarriage: A comment on Rosenfeld. *American Journal of Sociology*, *115*(4), 1252–1263.

Mare, R. D. (1991). Five decades of educational assortative mating. *American Sociological Review*, *56*(1), 15–32.

Mu, Z., & Xie, Y. (2014). Marital age homogamy in China: A reversal of trend in the reform era? *Social Science Research*, *44*, 141–157.

National Center for Health Statistics. (2017). *Provisional number of divorces and annulments and rate: United States, 2000-2016.* Accessed online on July 20, 2018: https://www.cdc.gov/nchs/data/dvs/national_marriage_divorce_rates_00-16.pdf

Oppenheimer, V. K. (1988). A theory of marriage timing. *American Journal of Sociology*, *94*(3), 563–591.

Poppel, F. V., Liefbroer, A. C., Vermunt, J. K., & Smeenk, W. (2001). Love, necessity and opportunity: changing patterns of marital age homogamy in the Netherlands, 1850–1993. *Population Studies*, *55*(1), 113.

Qian, Z., & Lichter, D. T. (2018). Marriage markets and intermarriage: Exchange in first marriages and remarriages. *Demography*, 1–27. Online first: https://doi.org/10.1007/s13524-018-0671-x

Qian, Z., & Preston, S. H. (1993). Changes in American marriage, 1972 to 1987: Availability and forces of attraction by age and education. *American Sociological Review*, 58(4), 482–495.

Qian, Z. (1997). Breaking the racial barriers: Variations in interracial marriage between 1980 and 1990. *Demography, 34*(2), 263-276.

Qian, Z. (1998). Changes in assortative mating: The impact of age and education, 1970–1890. *Demography*, *35*(3), 279-292.

Qian, Y., & Qian, Z. (2014). The gender divide in urban China: Singlehood and assortative mating by age and education. *Demographic Research*, *31*, 1337–1364.

Qian, Y., & Qian, Z. (2017). Assortative mating by education and Hukou in Shanghai. *Chinese Sociological Review*, *49*(3), 239–262.

Qian, Y. (2017). Gender asymmetry in educational and income assortative marriage. *Journal of Marriage and Family*, *79*(2), 318–336.

Raftery, A. E. (1986). Choosing models for cross-classifications. *American Sociological Review*, *51*(1), 145–146.

Raymo, J. M., Park, H., Xie, Y., & Yeung, W. J. J. (2015). Marriage and family in East Asia: Continuity and change. *Annual Review of Sociology, 41*, 471–492.

Rosenfeld, M. J., & Thomas, R. J. (2012). Searching for a mate: The rise of the Internet as a social intermediary. *American Sociological Review*, *77*(4), 523–547.

Schwartz, C. R. (2013). Trends and variation in assortative mating: Causes and consequences. *Annual Review of Sociology*, *39*, 451–470

Shafer, K. (2013a). Disentangling the relationship between age and marital history in age-assortative mating. *Marriage & Family Review*, *49*(1), 83–114.

Shafer, K. (2013b). Unique matching patterns in remarriage: Educational assortative mating among divorced men and women. *Journal of Family Issues*, *34*(11), 1500–1535.

Smits, J. (2003). Social closure among the higher educated: Trends in educational homogamy in 55 countries. *Social Science Research*, *32*(2), 251–277.

Shehan, C. L., Berardo, F. M., Vera, H., & Carley, S. M. (1991). Women in age-discrepant marriages. *Journal of Family Issues, 12*(3), 291-305.

Treiman, D. J. (2013). Trends in educational attainment in China. *Chinese Sociological Review*, 45(3), 3–25.

Verbakel, E., & Kalmijn, M. (2014). Assortative mating among Dutch married and cohabiting same-sex and different-sex couples. *Journal of Marriage and Family*, 76(1), 1-12.

Wang, Q., & Zhou, Q. (2010). China's divorce and remarriage rates: Trends and regional disparities. *Journal of Divorce & Remarriage*, *51*(4), 257–267.

Xie, Y., & Hu, J. (2014). An introduction to the China family panel studies (CFPS). *Chinese Sociological Review*, *47*(1), 3–29.

Yeung, W. J. J. (2013). Higher education expansion and social stratification in China. *Chinese Sociological Review*, *45*(4), 54–80.