What Do Parents Want? Parental Spousal Preferences in China

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I. Introduction

What do people look for in a marriage partner? Partner choice has important consequences for most life dimensions such as socioeconomic status, fertility, and overall well-being. In many contemporary societies, and most historical ones, parents are involved in the crucial process of selecting a spouse for their

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child. Even in societies where parents have no explicit involvement, parental support for their adult children's choices can make an important difference to the quality and durability of a marriage (Reczek, Liu, and Umberson 2010). In Chinese society, where marriage is extremely important, 33% of couples that married between 1980 and 2014 were introduced to each other by relatives.[1]

While estimating partner preferences has gained momentum in the economic literature (e.g., Belot and Francesconi 2006; Fisman et al. 2006; Kurzban and Weeden 2007; Hitsch, Hortaçsu, and Ariely 2010), parental preferences have mostly been neglected due to the focus on Western countries.[2] In the Chinese context, the literature mostly covers stated individual preferences and data from online platforms (e.g., Xia et al. 2014; Ong and Wang 2015). In this paper, we investigate elicited parental preferences for spousal characteristics.

Why are parental spousal preferences important? One reason is that parental preferences may differ from those of their adult children—indeed, there are biological and cultural reasons to expect this to happen, though the evidence for such differences in practice is limited.[3] If they differ, it is important to know which sets of preferences determine actual marriage patterns.

Parents in all countries are the main decision makers when it comes to primary and secondary education, and they heavily influence tertiary education and other premarital investments such as acquiring real estate. These decisions may also take into account how the investments change the characteristics of their child's expected spouse (Chiappori, Iyigun, and Weiss 2009). Parental spousal preferences of sons might therefore not only influence the type of wife their son marries but also the expected marriage market returns of daughters' premarital investments, and vice versa. Thus, parental preferences may be influential even if parents do not get to choose their children's marital partners directly. It remains an important question whether parental influences, particularly on the choice of daughters-in-law, encourage or discourage educational investments, in boys and especially in girls.

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[1] China Family Panel Study 2016; see app. A fig. 2.

[2] Notable exceptions are Banerjee et al. (2013) and Adams and Andrew (2019), who focus on India.

[3] The biology literature has focused on preferences for attractiveness and resources (see Bovet et al. 2018; Apostolou 2020); there is also evidence for cultural evolution of these preferences over time, both generally (Buss et al. 2001) and specifically in China (Chang et al. 2011; Xu and Ocker 2013).

The literature mentions a supposed cultural disapproval of men marrying women with higher education levels than their own (see a review of this literature by Van Bavel, Schwartz, and Esteve 2018). This has been claimed to be responsible for declining rates of marriage among highly educated women in many countries and especially in East Asia. If true, this might act as a discouragement to women, especially those from disadvantaged backgrounds: promoting education as a route of escape from poverty will not be convincing if it is perceived as coming with an indirect cost in terms of reduced appeal on marriage markets. The literature on marriages in Western countries suggests that any perceived marriageability penalty suffered by educated women has been declining in recent years (see Van Bavel, Schwartz, and Esteve 2018). However, Hwang (2016) finds that the phenomenon of the allegedly unmarriageable "gold miss" remains important in Japan and Korea. Bertrand et al. (2020) suggest that trajectories of marriage patterns in East Asia may differ persistently from those of Western countries because of more conservative gender attitudes in the former countries.[4] This is an issue we can directly address using our data.

In China, recent data from the China Family Panel Study (CFPS) shows that marriage is still the rule (only 2% of those aged 40–50 had never been married) and that marriages are highly homogamous in the dimensions of age and education. Homogamous matches are characterized as those in which spouses have the same educational level or similar age.[5] Yet it is not possible, without making strong assumptions, to derive spousal preferences solely from these marriage outcomes. Both homogamic preferences—preferences for those of the same type as well as increasing preferences for those of a commonly agreed "best type"—can explain homogamous matches.[6] Homogamous matches can also arise if there are no specific preferences but individuals with similar characteristics have a higher probability of meeting. These different options have different implications for the marriage market returns to education and the timing of marriage, and it is therefore valuable to obtain direct information on parental preferences.

Parental spousal preferences are most explicitly expressed when their child is of marriageable age and when they are involved in the search for their child's

[4] They include data on Japan, Korea, Taiwan, and Hong Kong.

[5] Homogamous matching should be distinguished from positive assortative matching, which means that individuals with higher values in some dimension tend to be matched with individuals who also have higher values in that dimension. Positive assortative matching implies homogamous matching when the distribution of characteristics for men and women is similar.

[6] When educational levels are similar between men and women, increasing preferences lead to homogamous matches. The highest type of man would then match with the highest type of woman, the second-highest type with the second-highest type, etc. This holds under the assumption of nontransferable utility, which we make explicitly later in the paper or, alternatively, under the assumption of a supermodular marriage surplus.

spouse (even if involvement means only to comment on the options). We interviewed men and women who were searching for a spouse for their adult child or relative at a public park in Kunming, in Southern China. The phenomenon of parents and other relatives searching for potential suitors in public parks at so-called "marriage markets" is nowadays common in Chinese cities. Their existence underlines the continuing involvement of parents in marriage decisions.

Parents interviewed for our study see themselves as agents for their children, complementing their child's search effort in half of the cases and often having their approval or even encouragement. They often spend substantial time on the search. Respondents were asked to evaluate a series of randomly created hypothetical profiles that we use to estimate spousal preferences. Profiles include information about income, education, age, ethnicity, and real estate ownership. They mimic the information that parents usually exchange at the public park. Furthermore, we ask respondents what educational levels and age they deem acceptable.

We also ask if parents get what they want: Do observed marriage outcomes align with parental preference? As we could not contact the respondents again because of our assurances of anonymity, we use a simulation approach and compare simulated marriages with actual marriages in the general population. Based on parents' estimated preferences for age and education, we simulate marriages with a standard Gale-Shapley algorithm (Gale and Shapley 1962). For the supply of spouses, we use individuals who recently married from the 2014 and 2016 CFPS, which contain information on age and education for both spouses.

We find that parents dislike profiles with an educational level that is lower than their daughter's or their tertiary-educated son's. We find little evidence for a dislike of women who are more educated than the man. Overall, we find some evidence of the potential reduced marriageability of educated women. Yet this is not because there is an aversion to highly educated daughters-in-law but rather an aversion to a son-in-law who is less educated than the daughter. Furthermore, the baseline specification of the simulations predicts educational homogamy quite well.[7] Yet we can observe that parents' dislike of sons-in-law that are less educated than their daughter decreases the proportion of matches where this happens in the simulation, something that does not correspond to the distribution of observed outcomes. In the observed distribution, matches in which the wife is slightly more educated than the husband are as common as matches in which the husband is slightly more educated.

We also find that parents prefer a son-in-law who is the same age as the daughter but a daughter-in-law who is younger than the son. Here, we also

[7] As the simulation ignores search friction in the marriage sorting process, only uses average preferences, and assumes nontransferable utility, the degree of homogamy on education is even higher in the simulation than in the actual outcomes.

observe a discrepancy between the simulation results and the actual outcomes: The simulations predict the most common case to be couples where the husband is 1–3 years older. In the real distribution, the most common case is the spouses having the same age. The difference between simulation based on parental age preferences and real outcome could be explained by changes in age preferences when unmarried men get older. Yet allowing for age-specific preferences does not improve the fit of the simulation. Weighting the general population to make it similar to the male population represented at the park does not improve the fit either.

We contrast parental preferences with preferences based on a local student sample. We find similar preferences for education, but while parents prefer a younger wife, male students do not have the same preferences for a younger partner. Overall, marriage simulations based on students' preferences explain educational and age homogamy slightly better than parental preferences. Finally, survey data suggest that while parents prefer a younger wife for their son, they accept wives who are the same age as their son until their son is over 30. As most marriages are between individuals in their mid-20s, most marriages are within parents' accepted limits but reflect young men's age preferences more than the parents' in our sample. Overall, divergences between parental and child preferences do exist, but they are neither very major nor very influential in explaining observed outcomes.

Our data set is of interest for several reasons in addition to having a unique set of parents as respondents. In contrast to data from online dating websites, our data allow us to credibly claim that parents are looking for a spouse for their adult child and not just for a short-term relationship. Physical presence at the park can be seen as a signal for a serious search effort. Most respondents have been at the park more than once, and questionnaire responses indicate that the search for a spouse has been discussed within the family. Thus, we are sure that respondents have thought about what they are looking for and are experienced in selecting potential candidates.

Also, because choice data are taken from hypothetical profiles that are randomly created, we do not have the issue of a selected pool to choose from and can ensure that the characteristics presented to subjects are not directly correlated. Since we focus on economic variables and do not include physical attractiveness, the results can be easily compared with outcome data from other data sets. The trade-off between income and physical attractiveness is investigated in a companion paper with a separate profile task (Bovet et al. 2018).[8]

[8] The profile task used in a companion paper took place after the hypothetical choice task used in this paper. The results are in line with the results here: Respondents value income only when they are searching on behalf of a female subject. When they are searching on behalf of a male subject, income is insignificant.

Links with the Literature

This paper adds to the growing literature that studies marriage preferences theoretically and empirically. The economic literature on marriage is based on the seminal work on marriage markets by Becker (1973), who models a market with two sides (men and women) and assumes transferable utility. Agents form matches and bargain about the distribution of the surplus that is generated by the match. The functional form of this marriage surplus is of particular interest.[9] It reflects preferences of both sides. Following Choo and Siow (2006), several papers have estimated the marriage surplus that can be identified under relatively weak assumptions. A summary can be found in Chiappori and Salanié (2016) and even more recently in Chiappori (2020).[10]

However, without assumptions on the structural form of the marriage surplus—the bargaining and searching process—one cannot identify men's and women's preferences separately. Recent studies have thus relied on additional preference data, for example, from online dating websites. These papers usually assume nontransferable utility (where men and women get a determined fixed utility) from the match, which also simplifies interpretation.[11] We follow this approach of identifying preferences directly from additional data. Our empirical strategy is most closely related to Hitsch, Hortaçsu, and Ariely (2010), who use data from an online dating website and follow the searching framework of Adachi (2003). Other papers use data from speed dating (Fisman et al. 2006, 2008) or online dating (Belot and Francesconi 2006; Kurzban and Weeden 2007; Xia et al. 2014; Ong and Wang 2015). Related to marriage, Banerjee et al. (2013) use rankings of responses to marriage advertisements in an Indian newspaper. Adams and Andrew (2019) use hypothetical marriage scenarios to elicit parents' spousal preferences for education and marriage age and beliefs about marriage prospects.

This paper also contributes to the topic of parental premarital investment, parental involvement in marriage decisions, and their influence on the marriage outcomes. In the Chinese context, Huang, Jin, and Xu (2012) find that couples that were introduced to each other by their parents or another relative have a higher cumulative income but lower marital harmony. Huang, Jin, and Xu (2017) add that couples that rely on their parents for finding a spouse have more children.

[9] The marriage surplus is mathematically defined as the utility created when two people get married minus the utilities of them staying single.

[10] Notable papers in this field are by Wong (2003), Logan, Hoff, and Newton (2008), Choo and Seitz (2013), Chiappori, Salanié, and Weiss (2015), and Galichon and Salanié (2015).

[11] An exception is Del Boca and Flinn (2014), who combine data on marriage outcomes and household production.

Parents are the main decision makers when it comes to early human capital investment. Their expectations on the returns to education are crucial for the educational decisions they make about their children. Studies that estimate the returns to education usually look at individual returns to education in the labor market. Giles, Park, and Wang (2019) use the disruption in educational access due to the Cultural Revolution as an instrument for education and find that a college degree versus high school degree increases hourly wages by around 37%. Li, Liu, and Zhang (2012) compare earnings between twins and find that a college degree increases earnings by around 40%. The uninstrumented and not corrected returns are even higher as they include the effects of unobserved ability or family background. If a college degree also increases the chances of marrying a highly educated spouse, this increases the overall returns to education.

The interaction between parental educational investment and marriage markets becomes explicit in the literature on marriage payments. Ashraf et al. (2020) show that parents invest more in the education of their daughters when this increases the amount of money they receive at marriage. The results from Roy (2015) suggest that dowry payments in India and education might be seen as substitutes by parents.

Our preference data and the simulations indeed suggest that marriage returns to education are high. A profile with a woman with a tertiary degree is around 9 percentage points more likely to be selected by the parents of a tertiary-educated man than a woman with a high school degree. A profile with a man with a tertiary degree is around 22 percentage points more likely to be selected by the parents of a tertiary-educated woman than a man with a high school degree. In the simulations without search frictions, 78% of couples have the same educational level (52% in the actual population).

There is a broader literature on marriage and human capital investment in developing countries outside China to which this paper contributes. Attanasio and Kaufmann (2017) confirm that Mexican students take marriage prospects into account in college enrolment decisions. Maertens (2013) show the importance of marriage age for educational investments in India, and Delprato, Akyeampong, and Dunne (2017) demonstrate the magnitude and persistence of these effects for sub-Saharan Africa. The Chinese experience is highly relevant to other countries that are seeking to develop integrated approaches to schooling policies taking marriage market dimensions into account.

Finally, this paper complements the literature on the changes in marriage patterns. Hu and Qian (2016) find that educational homogamy has increased over time, while Mu and Xie (2014) find that homogamy in age, as measured by the average age difference between the spouses, increased until the 1990s but since then has decreased slightly. Hu (2016) finds that the household

registration status (*hukou*) plays an important part in determining marriages. The household registration status is inherited from the parents and is an important determinant of socioeconomic status. Yu and Xie (2015) find an increase in the importance of economic prospects in urban China. Our study confirms that economic variables, such as income and real estate, are important characteristics in the marriage market, yet only for men. Education and age are characteristics taken into account on both sides.

II. Context

A. Parental Involvement in Marriage Decisions in China

The way to find a spouse in Chinese society changed substantially in the past century. For centuries, arranged marriage had been dominant. Parents chose the spouse for their child, often with the help of a professional matchmaker (Xia and Zhou 2003; Huang, Jin, and Xu 2017). After the Chinese Communist Party came to power, the government passed the Marriage Law, adopted in 1950, making arranged marriage illegal. It was in line with its effort to get rid of traditional Chinese classes (Engel 1984). Moreover, the government helped to abolish the traditional marriage system by encouraging women to join the labor force (Pimentel 2000; Xia and Zhou 2003). However, in rural areas, arranged marriage continued to be important and parents still influenced marriage outcomes (Xia and Zhou 2003). For instance, Riley (1994) uses data from a survey collected in 1986/1987 and finds that the number of arranged marriages has decreased. Yet parents continue to have influence over marriage decisions. Huang, Jin, and Xu (2017) find that 14.5% of urban couples and 48% of rural couples interviewed in 1991 were introduced to each other by their parents or other relatives.

The economic reforms of the late 1970s substantially changed the life of Chinese people, as China became increasingly open to the rest of the world (Higgins et al. 2002; Chang et al. 2011). The economic reforms led to an increase in economic opportunities, inequality, and mobility. Marriage again became a way to increase a family's social status and improve its financial situation (Fan and Huang 1998; Han, Li, and Zhao 2015), and Chinese parents continue to influence their children's marriage decision (Pimentel 2000). This process was accompanied by changes in marital preferences (Higgins et al. 2002; Higgins and Sun 2007; Chang et al. 2011).

Indeed, data from the 2010 CFPS show that the share of first marriages that were arranged by parents dropped sharply in the late 1940s and early 1950s (illustrated in app. A fig. 1; app. A, which includes app. A figs. 1–7 and app. A tables 1–8, as well as app. B, including app. B figs. 8 and 9 and app. B tables 9 and 10, are available online). The share of those who were introduced to their spouse by a friend or relative increased at the same time and continues to be

the predominant way. The 2010 survey does not make a difference between being introduced by friends or relatives. The 2016 survey asks the same question for the current spouse to a subset of the respondents and separates between those two options. In this subset, being introduced to each other by relatives was the predominant way to meet the spouse until the mid-1990s and continues to be among the most important ways to meet a spouse, together with being introduced by friends and meeting at work (illustrated in app. A fig. 2).

B. Parental Search in Public Parks

Every Saturday, one corner of the Green Lake Park in Kunming, the capital and largest city of the province of Yunnan in South China, hosts a "marriage market."[12] These marriage platforms are a new phenomenon but already widely spread. The most famous marriage search platform in a public park is at the People's Park in Shanghai, which started in 2004.[13]

In a dedicated area of the park in Kunming—accessible to the public—individuals search for a spouse for either themselves or for someone else. This marriage search platform was initiated by parents who used their weekends to chat to other parents with unmarried children. Over time, it developed into an established event. Parents and other participants talk to each other or post sheets of papers with basic information of their "unmarried subject" on the wall of the park with their own contacts. They may check the information of others on the wall or address one of the marriage agencies present at the park.[14] Parents would then set up meetings where their unmarried subject could meet the potential spouse. They therefore do not arrange marriages but make a preselection of candidates.

C. Marriage Patterns in Contemporary China

We use the China Family Panel Study from 2014 and 2016 to describe current marriage patterns.[15] The CFPS is a nationally representative survey, which contains information on the age and educational level of both spouses. In 2016, 78.4% of the respondents between 20 and 50 years old are married, 18.1% are single, 2.2% are divorced, and 0.8% are widowed. For those between 40 and 50, only 2% have never been married and 2.7% are divorced.

[12] With an estimated population of nearly 4 million (Cox 2018), Kunming is a middle-size city in China.
[13] According to an article by Al Jazeera (https://www.aljazeera.com/indepth/inpictures/2013/04/201343113125739211.html).
[14] In Kunming, marriage agencies also advertised their services at the public park. However, our survey results suggest that their services are rarely taken up, and their business models seem dubious.
[15] The CFPS is a large-scale, nationally representative panel survey project conducted by the Institute of Social Science Survey at Peking University.

Recent marriages between 2012 and 2016 are homogamous on the educational level (see fig. 1*A*). Educational levels are defined according to highest educational degree obtained: no degree (illiterate/semiliterate), primary school degree, middle school degree (also called junior high school), high school degree (also called senior high school), undergraduate degree, and graduate degree (master's or PhD). For nearly all educational levels, it is most common

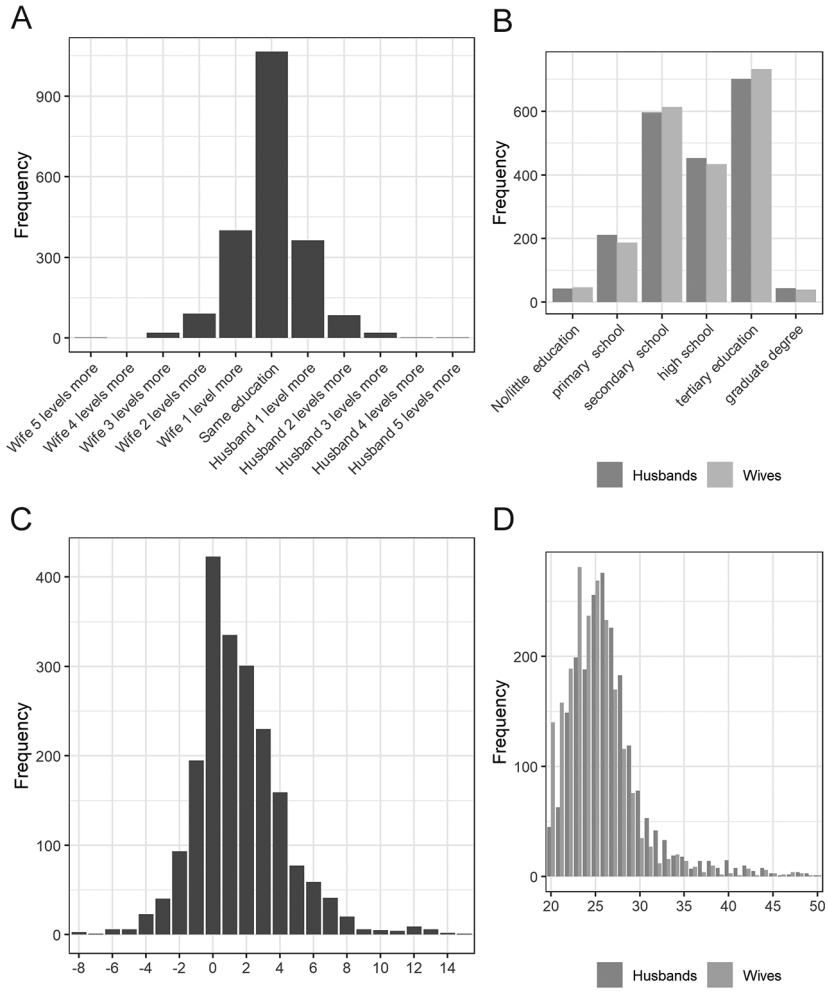

Figure 1. Frequency histograms for the educational and age difference between husband and wife for couples who married between 2012 and 2016 between the ages of 20 and 50. The educational distributions are not significantly different from each other (Kolmogorov-Smirnov [KS] statistic: 0.01, $p = .998$), while the age distributions are significantly different from each other (KS statistic: 0.18, $p = .00$). Difference is calculated as husband minus wife. Age difference is trimmed at −10 and +15. Source: China Family Panel Study 2014 and 2016. A color version of this figure is available online.

to marry someone who has the same educational level (the exception being individuals with a postgraduate degree, which is still rare). The second most likely case is that the spouse has an educational level that is one below or above. Importantly, there is no sign that marriages with a more educated wife are less common than those with a less educated husband, contrary to the fears about the unmarriageability of "overeducated" women we discussed above. The Pearson correlation coefficient between the educational level of husband and wife is significant at 0.41. We can also see in figure 1*B* that the educational distribution of men and women are very similar for this period.

The average age difference between husband and wife is 1.52 years. However, the peak of the age difference distribution is at the wife and the husband having the same age (see fig. 1*C*). In most couples, the husband is less than 5 years older. In around 13% of the cases, the wife is 1 or 2 years older. The Pearson correlation coefficient is strongly significant at 0.88. Figure 1*D* illustrates the age distributions. The age requirement for marriage in China is 20 for women and 22 for men, and we include only couples where both spouses are between 20 and 50 years old at the time of marriage.

III. Data

We ran a survey at the Green Lake Park every Saturday from late spring to early summer of 2016 named the Questionnaire for Search Activities for a Marital Partner in Yunnan (QSAMPY).[16] Participants were randomly approached by a student enumerator and received a small gift at the end of the survey.

Around 75% of respondents are searching for a spouse on behalf of someone else. Those that search for themselves have mostly been married before and are older than those who are represented by someone else. Those that are represented by their parents, an uncle, or an aunt have usually never been married. We are interested in parental preferences for first marriage and thus exclude those searching for themselves. We call the respondents searching for someone else "parents," though it includes other relatives if not explicitly specified. We call those on whose behalf the respondent is searching the "unmarried subject" or the "child," though this also includes some nieces and nephews and combines those who are never married, divorced, and separated; all are above 20 years old. Our sample in total includes 412 observations, of which 391 could be matched with their profile choices.

[16] We obtained approval from the Toulouse School of Economics–Institute for Advanced Studies in Toulouse Review Board for Ethical Standards in Research (reference 2016-03-003), as well as permission from Yunnan Normal University and the police department.

A. Respondents: The "Parents"

Respondents are predominantly female (64%) with an average age of 61. The majority are retired (86%) and married (91%).[17] Only 5% are at the park together with the unmarried subject. Around half of the respondents search on behalf of their daughter and one-third on behalf of their son. The rest searches on behalf of their niece, their nephew, or another relative. Summary statistics are displayed in appendix A table 1. The search platform does not attract many nonlocals. Most QSAMPY respondents live and are registered in the city where the data were collected. As expected for an urban Chinese sample, most parents have only one child (73%), and 82% of parents live with the unmarried subject. Though the province of Yunnan is ethnically diverse, 94% of respondents state Han ethnicity. The share of ethnic minorities in our sample is thus lower than in the city, where it was around 15% in 2007.[18]

The search efforts of the unmarried subject, the respondent, and other family members are often complementary. Nearly half of the respondents indicate that the unmarried subject is also searching for a spouse. When the respondent is a parent, the spouse of the respondent is often also involved in the search process (36%). When the respondent is another relative, the parents are usually looking as well (67%). Of those that say that the unmarried subject is not searching, "not having time/being too busy" is the most stated reason, followed by "not wanting to" and "being too shy."

Only 23% of the interviewed sample is at the park for the first time. Respondents focus on the search at the park: only 4% use another platform (mostly online platforms). Most of the unmarried subjects (72%) know that they are represented at the park. Of those, the majority (68%) approve of this procedure. Overall, 30% of the unmarried subjects encourage the respondent to search on their behalf. These responses highlight that in the majority of cases, the search for a spouse has been discussed within the family.

To investigate the respondent's motivation, we ask how they themselves met their spouse and ask them to rate preselected motives. Of QSAMPY respondents, 36% were introduced to their spouse by friends, only 3% by their families, and 17% by other relatives. Less than 1% indicate that their marriage was arranged (by their parents, relatives, or a marriage agency). These numbers are comparable with those of the general population. Therefore, respondents are not searching because they themselves met their spouse in a similar

[17] Meanwhile, 5% are widowed and 2.5% are separated or divorced.

[18] The original source for this information is not available anymore. However, it is quoted on several other websites, including on Wikipedia and at https://www.gokunming.com/en/blog/item/397/kunming_residents_by_the_numbers.

way. Furthermore, parents rank altruistic motives as more important than more selfish ones (see app. A table 3), though there are obviously questions about whether social desirability bias diminishes their willingness to admit to selfish motives. Altruistic motives include "wanting their child to have someone who takes care of him or her" and "having their child to have someone he/she feels affection for," and more selfish motives include "having a son- or daughter-in-law take care of the respondent when the respondent is older" or "having grandchildren." Yet the latter category is also often ranked as important. This is similar for both female and male unmarried subjects. These survey results suggest that parents see themselves as agents for their children. This does not exclude that parents put direct or indirect pressure on their children to find a spouse.

B. Unmarried Subjects: The "Children"

The average age of unmarried subjects is 33, and 58% are women. The sample is very educated: 98% have at least finished professional high school, and 60% have completed a university degree; 92% are employed, and 5% are self-employed or entrepreneurs; while 94% of unmarried subjects are of Han ethnicity, 2.8% of Bai ethnicity, and 2.2% of another ethnicity.

The never-married subjects are older and more educated than the average never-married person within the city. For this comparison, we use roster data of about 4,970 individuals from the representative Skills Towards Employability and Productivity (STEP) program, collected in 2012.[19] While the sex ratio in the general population is balanced, women are overrepresented in the QSAMPY data. In the STEP data, only one unmarried person out of more than a thousand completed tertiary education, compared with 60% of unmarried subjects in our sample, and only 55% of unmarried STEP individuals finished high school, compared with 98% of unmarried subjects in our sample. In the STEP sample, only 62% state having worked at least 1 hour in the past 7 days compared with 97% of unmarried subjects in our sample.[20] The Green Lake Park search platform seems to attract local, educated working individuals who are above the average marriage age.

[19] Collected by the World Bank within urban Kunming. The sampling method follows census paths. Appendix A table 4 shows the comparison.

[20] There are obvious limitations to the comparability between the QSAMPY data collected in 2016 and the STEP data from 2012. The marriage age between 2012 and 2016 presumably increased, as did educational attainments. However, the difference in the average age and educational levels are unlikely to just be driven by an increase by the average trends.

C. The Student Sample

As a comparison group, we collected data from 283 students at Yunnan Normal University. Students were randomly approached in front of the student canteens. Students are commonly used for surveys about marriage preferences because they are generally unmarried but of marriageable age. The results obtained from this sample can be compared with other studies. On the downside, students are not necessarily looking for a long-term partner at the time of the interview. They might not have very clear preferences or confound them with preferences they have for a current short-term partner.

The student sample is female biased: 57% of the respondents are women (see app. A, table 2). Yet this reflects the university population, where women are overrepresented. The average age is 21. The student sample is more ethnically diverse, with only 82% Han Chinese and 18% ethnic minorities. Only 11% of the students are from the city of Kunming. The majority (65%) are from another place in Yunnan and 23% from another province. The students are, therefore, more rural (70% grew up in a rural area compared with 9% of unmarried subjects), ethnically diverse, more educated, and substantially younger than the Green Lake Park unmarried subjects.

IV. Preference Estimation: What Do Parents Want?

A. Hypothetical Profiles

During the interviews, respondents were shown four pairs of hypothetical profiles, displaying information on age, income, education, ethnicity, and real estate ownership. They mimicked information that participants usually share with others at the park, either written or orally. We asked respondents to state if the profile represents a person they would want their unmarried subject to meet ("meet choice").[21] We therefore have eight observations per respondent. The profiles were clearly described as hypothetical, and the answers were not incentivized. The choice data, thus, do not provide revealed preferences. However, respondents are about to choose whom they want their unmarried subject to meet at the park. They have thought about which characteristics they prefer and are about to evaluate the same information. They do not have an incentive to deviate from the strategy they use for their actual choices. Therefore, stated preferences are presumably close to revealed preferences in this context.

The advantage of the hypothetical choices is that characteristics are randomly created and not restricted due to platform entry or first sign of interest (as in, e.g., Hitsch, Hortaçsu, and Ariely 2010; Banerjee et al. 2013). However,

[21] Afterward, they were also asked which profile of the two they preferred ("preference choice"). The results are omitted due to strong similarities.

Profile A			Profile B	
Age:	35		Age:	30
Education:	Bachelor Degree		Education:	High School
Monthly Income:	2000		Monthly Income:	4000
Ethnicity:	Han		Ethnicity:	Bai
Real Estate:	Yes		Real Estate:	Yes

Figure 2. Example for the hypothetical profiles that were shown to respondents of the 2016 QSAMPY. This is a translation, as the original profiles were in Mandarin Chinese.

before the respondents saw the profiles, they had to choose a broad age category they were interested in. The choice included 20–39 years, 30–49 years, 40–59 years, or over 50 years old. Each age bracket spanned 20 years or more. We wanted to avoid repeatedly showing participants profiles that were far off the desired age range, while observing their acceptable age limits. For students, the age category was either 16–29 or 20–39.

Figure 2 displays an example profile pair. The educational level was drawn from middle school, high school, bachelor's degree, and master's degree.[22] High school and university had a higher likelihood of being drawn—again, to avoid participants' facing several unacceptable profiles. The monthly income indicated was between ¥2,000 and ¥8,000. The ethnicity was either Han, Yi, or Dai, with Han ethnicity having a higher likelihood to be on the profile. Real estate ownership was either "yes" or "no" with the same likelihood and was not further specified.

B. Preference Estimation Framework

We assume that participants agree to a meeting if they expect the utility generated by the potential match to be higher than their "reservation utility," which is the utility of staying single and continuing the search. We define the utility a woman w gets from marrying a man m as $u_w(m)$ and the utility a man m gets from marrying a woman w as $u_m(w)$. We denote the reservation utility of women w v_w and the reservation utility of man m v_m. The probability of the respondents selecting a profile is defined as the probability that the utility derived from the match is higher than the reservation utility:

$$\text{Prob}(\text{meet} = 1) = \text{Prob}(u_w(m) - v_w \geq 0). \tag{1}$$

This method is derived from the model of Adachi (2003) and also used by Hitsch, Hortaçsu, and Ariely (2010). We parameterize the utility function of

[22] Education is officially mandatory until the completion of middle school (9 years of education). Afterward, students can decide to continue schooling at different types of (senior) high school for 3 years, which was not further specified in the profiles.

woman w $u_w(m)$ as a function of man m's observed characteristics, how they interact with woman w's characteristics plus an error term that captures unobserved pairing-specific characteristics, with θ being the parameters to estimate

$$u_w(m) = f(m, w'm, \theta) + \epsilon_{w,m}. \tag{2}$$

Assuming $\epsilon_{w,m}$ is independent and identically distributed with the standard logistic distribution, we can derive the binomial logistic regression:

$$\begin{aligned} \text{Prob}(\text{meet} = 1) &= \text{Prob}(f(m, w'm, \theta) - v_w \geq 0), \\ &= \frac{\exp(f(m, w'm, \theta) - v_w)}{1 + \exp(f(m, w'm, \theta) - v_w)}. \end{aligned} \tag{3}$$

This equation can be estimated using a logit regression. We control for v_w or v_m as appropriate by including individual fixed effects.

C. *Preference Estimation Results*

We run an unconditional logit regression with the choice indicator as dependent variable. The indicator equals 1 if the respondent would want the unmarried subject to meet the person described in the profile. We include the characteristics of the profile: indicators for the different educational levels, the age category of the profile and the subject, the logarithm of income, and indicators for real estate ownership and for Han ethnicity. The reference category for education is "profile: junior high school." The reference category for age is "profile: less than 25 years." The coefficients on the age categories should be interpreted carefully as the respondents first made a selection about the broad age category (spanning around 20 years) and then were shown the respective age profiles.

The results are displayed in table 1 separately for men and women. We also split the sample between unmarried subjects with and without a tertiary degree. We include individual fixed effects and cluster standard errors at the individual level. This implies that only respondents that have variation in their responses are included and those that always say "yes" or "no" to all profiles are excluded, which applies to 26 respondents. This leaves us with 365 respondents and 2,913 profile choices.[23] The coefficients display average marginal effects. Appendix A table 7 and appendix B table 8 compare the results of the

[23] Out of the 412 respondents, 391 could be matched with their profile choices (see app. A table 3). Of those, some could not be matched with all their eight choices: average 7.97 profile choices per respondent.

TABLE 1

REGRESSING PROFILE SELECTION ON PROFILE CHARACTERISTICS—GREEN LAKE PARK SAMPLE

	Female Unmarried Subject			Male Unmarried Subject		
	All (1)	Without Degree (2)	With Degree (3)	All (4)	Without Degree (5)	With Degree (6)
Profile:						
High school degree	.120***	.157**	.114***	.122***	.097	.200***
	(.028)	(.069)	(.029)	(.045)	(.065)	(.054)
Undergraduate degree	.312***	.255***	.335***	.160***	.079	.291***
	(.036)	(.073)	(.040)	(.048)	(.070)	(.062)
Graduate degree	.365***	.235***	.427***	.103*	−.061	.345***
	(.042)	(.071)	(.049)	(.055)	(.076)	(.069)
Han ethnicity	.044*	.098**	.021	.032	.015	.048
	(.023)	(.048)	(.026)	(.031)	(.040)	(.047)
Log(income)	.149***	.171***	.135***	−.038	−.118**	.069
	(.028)	(.054)	(.032)	(.039)	(.052)	(.058)
Age 26–30	.081**	−.051	.113***	.037	.065	.006
	(.038)	(.080)	(.043)	(.053)	(.066)	(.082)
Age 31–35	.153***	.032	.180***	−.101*	−.086	−.114
	(.042)	(.095)	(.047)	(.052)	(.069)	(.077)
Age 36–40	.186***	.003	.250***	−.287***	−.226***	−.322***
	(.054)	(.104)	(.062)	(.054)	(.074)	(.079)
Age 41–45	.065	−.035	.095	−.419***	−.393***	−.423***
	(.063)	(.117)	(.077)	(.056)	(.073)	(.098)
Over age 45	−.089	−.133	−.095	−.461***	−.433***	−.457***
	(.067)	(.125)	(.075)	(.050)	(.063)	(.103)
Owns real estate	.075***	.086**	.070**	.019	.027	.024
	(.025)	(.042)	(.030)	(.030)	(.042)	(.041)
Observations	1,733	496	1,237	1,180	652	528

Source. QSAMPY 2016.

Note. Dependent variable: indicator of wanting to meet. Logit regression includes individual fixed effects (unconditional logit); coefficients indicate average marginal effects. Standard errors, clustered at the individual level, are in parentheses. Female unmarried subject = respondent is choosing on behalf of a woman; male unmarried subject = respondent is choosing on behalf of a man. Reference category for education: "profile: junior high school." Reference category for age: "profile: up to age 25." Columns 2 and 5 include only subjects without a tertiary degree; cols. 3 and 6 include subjects with a tertiary degree.

* $p < .10$.

** $p < .05$.

*** $p < .01$.

unconditional logit with a linear probability model and a conditional logit. Results are nearly identical.[24]

[24] We decided to use the unconditional logit as it relates to the theoretical estimation framework and allows the calculation of average marginal effects. Though the unconditional logit can suffer from bias, the bias is usually small when there are at least eight observations per individual (see Katz 2001; Coupé 2005), as is confirmed in our case by the close correspondence of the unconditional and conditional estimations. Using a logit estimation automatically excludes observations that do not vary in the dependent variable (those that always state "no" or "yes" to all profiles they face). However, these are only a small share of the sample (6.6%). We also find that average marginal effects correspond closely to the coefficients of the linear probability model, which includes all observations. The linear probability model can suffer from significant bias when there are important differences in

In table 2, the age, education, and income levels are replaced by the difference between the unmarried subject's age, education, and income and the profile's age, education, and income. Real estate is also interacted with own real estate ownership. This specification has fewer observations as respondents were reluctant to share certain information about the unmarried subject, particularly income. There is too little variation in the ethnicity of the unmarried subject, so that we do not include interaction terms with own ethnicity.

A small share of unmarried subjects has already been married (18%). The following results are robust to excluding them. There are too few observations to include interactions according to marital status.

1. Results for Women

We first look at spousal preferences when the unmarried subject is a woman. The respondents are thus looking for a son-in-law.

Education. The likelihood of selecting the profile increases significantly with the educational level of the profile. This holds for both women with and without a university degree (table 1, cols. 1–3). On average, a profile with a graduate degree is 36.5 percentage points more likely to be selected than one with junior high school. The average marginal effect of education is higher when the female subject has a tertiary degree. Respondents searching on behalf of a female subject with a tertiary degree have strictly increasing preferences for education: they dislike men with a lower educational level and like men with a higher educational level (see table 2). When the female unmarried subject does not have a tertiary degree, respondents dislike profiles with less education, but the coefficient for a higher educational level is not significant and close to zero.

Income. Respondents prefer male profiles with higher income. A profile with double the income has a 15 percentage point higher likelihood to be selected. The coefficient is higher for women who do not have a tertiary degree but not significantly so. Table 2 confirms that preferences are strictly increasing, though for subjects with a tertiary degree, the coefficient for having more income than the subject is not significant.

Real estate. On average, owning real estate increases the likelihood of being chosen by around 7.5 percentage points. This holds for women with

unobserved characteristics between those whose covariates change and those whose covariates do not change (see Angrist and Pischke 2008). However, in our case, the covariates (the characteristics of the profiles) are allocated randomly.

TABLE 2

REGRESSING PROFILE SELECTION ON PROFILE CHARACTERISTICS RELATIVE TO UNMARRIED SUBJECT'S CHARACTERISTICS—GREEN LAKE PARK SAMPLE

	Female Unmarried Subject				Male Unmarried Subject			
	All (1)	Without Degree (2)	With Degree (3)	All (4)	All (5)	Without Degree (6)	With Degree (7)	All (8)
Educational difference (+)	.050	.016	.096**	.049	−.044	−.048	.047	−.048
	(.031)	(.042)	(.045)	(.031)	(.031)	(.037)	(.060)	(.030)
Educational difference (−)	−.175***	−.156***	−.173***	−.175***	−.116***	−.042	−.144***	−.109***
	(.020)	(.049)	(.021)	(.020)	(.028)	(.048)	(.030)	(.027)
Profile: Han ethnicity	.048**	.091*	.027	.047**	.028	.010	.041	.022
	(.023)	(.047)	(.026)	(.023)	(.032)	(.041)	(.049)	(.031)
Income difference (+)	.139***	.188**	.096	.137**	−.062	−.116	.068	−.061
	(.053)	(.090)	(.068)	(.054)	(.073)	(.092)	(.117)	(.073)
Income difference (−)	−.188***	−.167	−.191***	−.185***	−.010	.105	−.089	.000
	(.046)	(.107)	(.051)	(.047)	(.061)	(.092)	(.078)	(.062)
Age difference (+)	−.023***	−.015**	−.027***	−.024***	−.051***	−.052***	−.049***	−.054***
	(.004)	(.007)	(.005)	(.007)	(.010)	(.015)	(.013)	(.011)
Age difference (−)	−.045***	−.021*	−.055***	−.094***	.008	.004	.010	.052***
	(.007)	(.011)	(.010)	(.013)	(.005)	(.007)	(.007)	(.014)
Profile: owns real estate	.124***	.113	.133**	.120***	.058	.076	.057	.058
	(.045)	(.076)	(.057)	(.045)	(.055)	(.074)	(.089)	(.052)
Subject: owns real estate X	−.096*	−.051	−.115*	−.084	−.042	−.074	−.022	−.048
Profile: owns real estate	(.054)	(.095)	(.066)	(.054)	(.065)	(.088)	(.102)	(.062)
Age difference (+) squared				−.000				.001***
				(.000)				(.000)
Age difference (−) squared				.006***				−.004***
				(.001)				(.001)
Observations	1,693	480	1,213	1,693	1,148	636	512	1,148

Source. QSAMPY 2016.

Note. Dependent variable: indicator of wanting to meet. Logit regression includes individual fixed effects (unconditional logit); coefficients indicate average marginal effects. Standard errors, clustered at the individual level, are in parentheses. Female unmarried subject = respondent is choosing on behalf of a woman; male unmarried subject = respondent is choosing on behalf of a man. The differences are calculated as the characteristic of the profile minus the characteristic of the unmarried subject. Columns 2 and 6 include only subjects without a tertiary degree; cols. 3 and 7 include subjects with a tertiary degree.

* $p < .10$.

** $p < .05$.

*** $p < .01$.

and without a university degree. The preference is driven by women who do not own real estate themselves: if the female subject does not have real estate, a profile with real estate has a 12 percentage point higher likelihood to be selected.

Age. Table 1 illustrates that respondents prefer the age categories between 26 and 40 over young profiles "up to 25 years old" (searching on behalf of unmarried female subjects with an average age of 32.6). The age categories "age 36–40" have the highest average marginal effect. Table 2 shows that indeed respondents dislike a negative and a positive age difference between the unmarried subject and the profile. They prefer someone of a similar age. Table 2, column 4, includes squared terms of the age variables, and figure 3*A* illustrates the results. Respondents dislike a negative age difference more than a positive age difference: the predicted likelihood of selecting a profile drops sharply with a negative age difference but only slowly with a positive age difference. Therefore, preferences are single peaked and homogamic.

Ethnicity. We find that respondents choosing on behalf of a female subject have a preference for Han ethnicity. On average, they are around 4.4 percentage points more likely to select a profile that states Han ethnicity. This

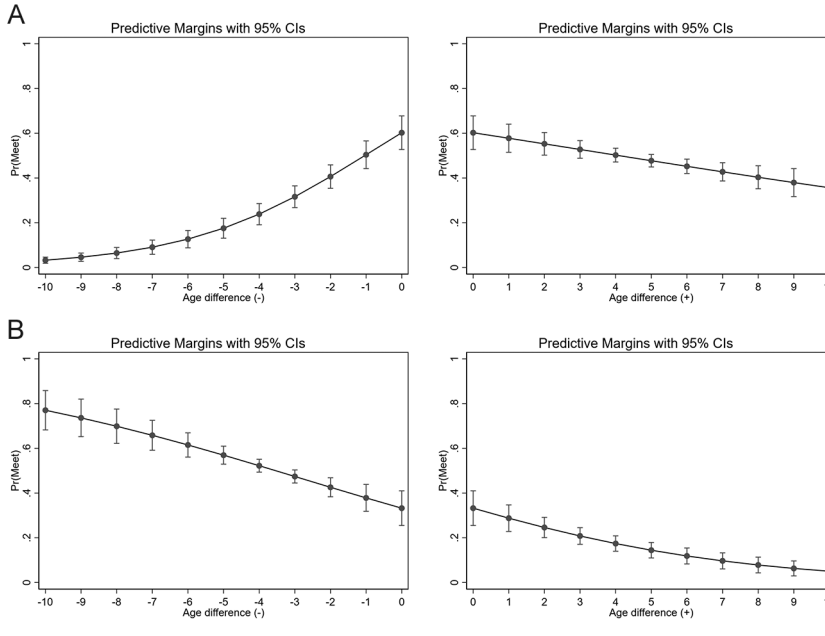

Figure 3. Predicted likelihood of choosing the profile according to age difference (age of profile minus age of unmarried subject). Based on table 2, column 4 (*A*) and column 8 (*B*).

preference is driven by respondents searching on behalf of a subject without tertiary education. These are 10 percentage points more likely to select a profile that states Han ethnicity.

2. Results for Men

We now look at spousal preferences when the unmarried subject is a man. Respondents are thus looking for a daughter-in-law.

Education. Respondents, on average, prefer educated profiles. A female profile with an undergraduate degree is 16 percentage points more likely to be selected than a profile with only junior high school. Yet the coefficients are not significant for male subjects without a tertiary degree. For tertiary-educated subjects, a profile with an undergraduate degree has a 29 percentage point higher likelihood to be selected than one that has only a junior high school degree (table 1, col. 6). We find little evidence for a dislike of "too educated" profiles. The coefficient for being more educated than the subject is negative but not significant (table 2, col. 5). The main form of such dislike occurs when the subject does not have a tertiary degree: a female profile that states "graduate degree" is significantly less likely to be selected by parents than a profile with only a high school degree.[25] For men with a tertiary degree, respondents clearly dislike profiles with a lower educational degree but show no preference for a higher degree. Preferences for educational levels seem, therefore, to be homogamic.

Income. On average, there is no preference for or against the female income (table 1, col. 4). Yet respondents choosing on behalf of subjects without a tertiary degree dislike a high income (col. 5). For those choosing on behalf of men with a tertiary degree, the coefficient is positive but not significant. For relative income (table 2), none of the coefficients is significant. Yet the signs are opposite between subjects with and without a tertiary education. For men without tertiary education, respondents might be less likely to select the profile when the woman earns more than the man.

Real estate. We do not find a preference for real estate ownership. The coefficient for real estate for those who do not own any themselves is positive, though not statistically significant (see table 2, col. 5).

Age. Older female profiles have a lower likelihood of being selected (table 1). For example, a profile in the age category between 36 and 40 has a 28.7 percentage point lower likelihood than a young profile "up to 25 years old" (for respondents searching on behalf of unmarried male subjects with

[25] Coefficient: $-.16$, $p = .016$.

an average age of 34). Looking at the age difference, we find that respondents dislike a positive age difference (where the woman is older than the unmarried subject; table 2). Introducing squared terms (table 2, col. 8), we find that respondents prefer younger women, but this preference decreases with the age gap. Figure 3*B* illustrates the dislike of older women in the right panel and a preference for younger women in the left panel. At higher age differences, we have less power and do not know whether preferences are decreasing at some point (the mathematical optimum lies at 15 years difference).

Ethnicity. For male subjects, we do not find a preference for Han ethnicity. While the coefficient is positive, it is not significantly different from zero on average, nor for male subjects with or without tertiary education.

D. The Value of Age, Education, and Income in the Marriage Market: Overview

These data on parents' preferences suggest that the claimed reduced marriageability of educated women may be a potential problem but not for the usually stipulated reason, which is aversion to highly educated daughters-in-law. The only such aversion we have encountered is to women with a postgraduate degree among parents of men with no degree at all—it is an aversion to extreme rather than moderate differences in education. Instead, however, we see evidence of an aversion to sons-in-law that are less educated than the daughter. This suggests that if educated women are less likely to marry, it is because they do not find acceptable partners rather than because they are considered less desirable.

Overall, parents still have a preference for the woman being younger. On average, a woman with a high school degree would have to be more than 10 years younger to have the same selection likelihood as a women with a university degree that has the same age as the unmarried man. For a man with tertiary education, a female profile with a university degree that is 3 years older than the man has the same likelihood of being selected as a woman with a high school degree and the same age as the man. For men without tertiary education, older female profiles are always less likely to be selected, independent of their educational level.

The combined effect of preference in these two dimensions, age and education, is to make education a more important dimension of preference than age for relatively educated men and women, while age is a more important dimension of preference than education for relatively uneducated men. This suggests a complementarity between male and female education in the following sense: for an educated individual (of either gender), parents care about how educated the potential spouse is.

Respondents generally prefer high-income male profiles with real estate, particularly so when their daughter does not have real estate herself. There is some aversion to high-earning female profiles but only for parents of men with low education.

V. Match Simulations: What Do Parents Get?

The previous section focused on what parents prefer. Yet we would also like to know how these preferences are connected to the actual outcome. Do parents get what they want? Unfortunately, we could not contact the respondents again because of our assurances about anonymity. We therefore use a simulation approach based on the estimated preferences. In this section, we ask whether the preferences can explain the marriage patterns in the general population. The estimated preferences determine the spouse demand functions, and the characteristics of the recently married general population determine the supply. We then compare simulated marriages with actual marriages and discuss when they overlap and when not.

A. Simulation Specifications

The 2014 and 2016 CFPS include information on the educational levels and the age of both spouses for marriages that were formed between 2012 and 2016. Unfortunately, they do not include information on ethnicity or premarital income or real estate ownership for both spouses. We use these observations as supply of husbands and wives. For each woman w and man m, we predict the likelihood of choosing each man m or woman w based on equation (3) and the estimated parameters of θ. We denote this likelihood the "selection likelihood." In the profile task, this is equivalent to the respondent selecting the profile p on behalf of the unmarried subject i. Denote Y_{ip} the indicator for saying "yes" to profile p for subject i. We use θ from three specifications.[26]

> Specification 1 (Baseline). Includes the positive and negative age and educational difference (profile minus unmarried subject) as well as age squared terms:

[26] Appendix B table 7 displays the estimates for θ for the three specifications for men and women. We use only the differences between the characteristics of the individual and the potential match and not the levels. We previously found that most preferences are dependent on own characteristics. Also, we do not have a preferences estimation for lower educational degrees such as primary school only or no education. We therefore make the assumption that the preferences for educational differences are linear, so that we can include couples where at least one spouse has an educational level less than secondary school.

$$Y_{ip} = \theta_1 \Delta \text{Age}_{ip}(+) + \theta_2 \Delta \text{Age}_{ip}(-) + \theta_3 \Delta \text{Age}_{ip}^2(+) + \theta_4 \Delta \text{Age}_{ip}^2(-) + \theta_5 \Delta \text{Education}_{ip}(+) + \theta_6 \Delta \text{Education}_{ip}(-) + \varepsilon_{ip}. \quad (4)$$

SPECIFICATION 2 (Education contingent). Includes the educational differences interacted with an indicator if the subject has a university degree and the age differences

$$Y_{ip} = \theta_1 \Delta \text{Age}_{ip}(+) + \theta_2 \Delta \text{Age}_{ip}(-) + \theta_3 \Delta \text{Age}_{ip}^2(+) + \theta_4 \Delta \text{Age}_{ip}^2(-) + \tilde{\theta}_5 \Delta \text{Education}_{ip}(+)' \text{ uni degree}_i + \tilde{\theta}_6 \Delta \text{Education}_{ip}(-)' \text{uni degree}_i + \varepsilon_{ip}. \quad (5)$$

SPECIFICATION 3 (Age contingent). Includes the age differences interacted with an indicator if the subject is over 30 and the educational differences

$$Y_{ip} = \tilde{\theta}_1 \Delta \text{Age}_{ip}(+)' \text{ over } 30_i + \tilde{\theta}_2 \Delta \text{Age}_{ip}(-)' \text{ over } 30_i + \tilde{\theta}_3 \Delta \text{Age}_{ip}^2(+)' \text{ over } 30_i + \tilde{\theta}_4 \Delta \text{Age}_{ip}^2(-)' \text{ over } 30_i + \theta_5 \Delta \text{Education}_{ip}(+) + \theta_6 \Delta \text{Education}_{ip}(-) + \varepsilon_{ip}. \quad (6)$$

The higher the predicted selection likelihood of a woman w for men m, the higher the utility woman w derives from being matched with men m (see eq. [1]). The predicted selection likelihood thus gives us a cardinal ranking: The man with the highest selection likelihood is the woman's first choice, the man with the second-highest selection likelihood is the woman's second choice, and so forth.

The marriage market simulation corresponds to the man-proposing Gale-Shapley algorithm (Gale and Shapley 1962): Men propose to the woman that they rank the highest based on the predicted selection likelihood. A woman with one proposal stays with the proposer. A woman who receives more than one proposal selects the man that she ranks highest among them and rejects the others. In the second round, the rejected men propose to the woman that they attribute the second-highest rank. Women then repeat their selection among the proposals. This is repeated until all individuals are matched.[27]

The Gale-Shapley algorithm assumes that matches occur under conditions of nontransferable utility. Some authors have proposed that transferable utility

[27] In order to verify the robustness of the resulting distribution, we also run the algorithm with women making the proposals and men rejecting and accepting proposals (the woman-proposing Gale-Shapley mechanism). The results are very similar.

is a more realistic assumption for marriage (see Chiappori, Iyigun, and Weiss 2009; Chiappori, Costa Dias, and Meghir 2018). In the context of our study, assuming nontransferable utility facilitates the interpretation of individual preference data, as it assumes that individual preferences for meetings are on average predictive of subsequent marriages (avoiding, e.g., the possibility that meetings with apparently more desirable partners lead subjects systematically to revise downward their preferences once they become aware of their weaker bargaining position). In the absence of evidence about systematic divergences between stated preferences and real outcomes, this seems to us the most intuitively reasonable way to proceed.

The Gale-Shapley mechanism forces all women and men to match. Yet there could be matches that would not form because one side would rather prefer to stay single. To address this issue, we calculate the lowest selection likelihood that is observed in the real outcome data for each specification and each educational level. For each woman w and each man m, we predict the selection likelihood of their actual spouse, based on θ. We determine the lowest 1 percentile of actual selection likelihoods for women and men in each educational category, respectively, as the minimum thresholds.[28] We then include this sex- and education-specific threshold as the outside option in the simulation. In every proposal round, men can propose to their outside option if she has a higher rank than the next woman they would otherwise propose to. Simultaneously, women reject all offers that are lower than their outside option. At the end, we can compute how many men and women stayed with their outside option.

B. Simulation Results

1. Educational Distribution

The frequency histograms of the actual educational difference between husband and wife and the simulated educational differences are displayed in figure *4A*. Appendix A table 8 summarizes the main characteristics of the actual distribution and the three predicted distributions. We observe that baseline specification 1 predicts a high degree of educational homogamy. Indeed, simulated matches are more homogamous in the dimension of education than is observed in the actual distribution. The share of simulated matches with the same educational level is 78%, compared with 52% in the real distribution. This higher degree of homogamy can be explained by the lack of search frictions in the simulation. Search frictions in the marriage market can include search costs or geographical limits who one can meet. Also, the preference

[28] We chose to use the lowest 1 percentile instead of the lowest value to make our results robust to outliers.

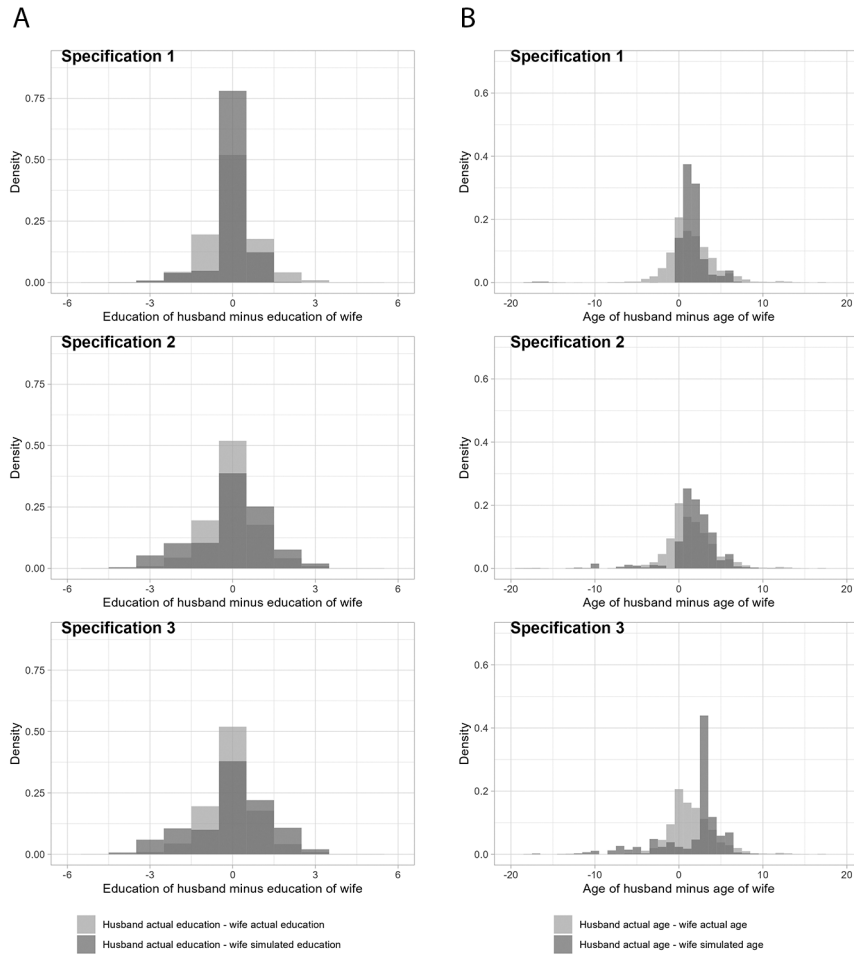

Figure 4. Simulated educational distribution based on parental and student preferences, in comparison with the real distribution. The real distribution is from spouses who married between 2012 and 2016. Preference parameters are taken from appendix B table 9. Source: China Family Panel Study 2014 and 2016. A color version of this figure is available online.

estimate is the average preference, and this might neglect important preference heterogeneity. Finally, assuming nontransferable utility might also lead to a higher level of homogamy in the simulations than in the actual matches, when matches form under some degree of transferable utility.

Specifications 2 and 3 predict fewer homogamous matches, have a higher coefficient of variation in the educational differences between spouses, and have a lower correlation between the spouses' educational levels. These specifications have group-specific estimates: specification 2 has separate estimates for education for individuals with a high university degree and without. In specification 3, we have group-specific estimates on age for those where the unmarried subject

is below 30 and above. These group-specific estimates, though possibly closer to the true parameters, are also noisier. The noisily measured estimates can explain the low-correlation coefficients and the high coefficients of variation.

Finally, we observe that in all three simulations, there are more matches in which the husband has one more educational level than the wife than matches in which the wife has one more educational level than the husband. In the actual distribution, these two cases have a very similar frequency. In our sample, parents prefer a daughter-in-law with approximately the same educational level as their son and sons-in-law that are at least as educated as their daughter. Matches in which they both have the same level are thus an equilibrium outcome, as specification 1 clearly highlights. Matches in which the husband has one more educational level are also a frequent outcome in the simulation, while matches in which the wife has one more educational level are less so.

2. Age Distribution

Figure 4*B* illustrates the comparison in the distributions for the age differences between husband and wife. The baseline specification shifts the peak of the distribution to the right by 1 year—where husbands are 1 year older than their wives. In the actual distribution, the modal point is at the husband and the wife having the same age. In specification 2, most matches have an age difference between 0 and 4, yet the mode is also at the husband being 1 year older. In specification 3, the mode is even at the husband being 3 years older. Again, specifications 2 and 3 based on parents' preferences predict distributions with a higher coefficient of variation and lower correlations between the age of spouses.

In the simulations, there is a modal age gap of 1–3 years, driven by parents preferring younger daughters-in-law. The actual outcome, where the most common case is spouses having the same age but the average age gap is husbands being 1.5 years older, suggests weaker preferences of this type. This could be because the unmarried subjects in the QSAMPY sample are, on average, older than the median marriage age in the general population. Parents with an older son might prefer a higher age gap for fertility reasons. Indeed, some studies show that male individual age preferences change with age (Kenrick and Keefe 1992; Walter et al. 2020). Yet accounting for different preferences for unmarried subjects above and below 30 only increases the modal age gap in the simulation rather then decreasing it (specification 3).

3. Allowing for Unmatched Individuals

Appendix A figure 3 compares the simulated distributions with and without the outside option to stay unmarried for education and appendix B figure 4

for age. Appendix B figure 6 displays the rates of the unmarried population by education and sex. In specification 1, less than 1% end up unmatched. Therefore, the two distributions are almost identical. Specification 1 thus seems to have a good fit—it predicts an unmarried rate similar to the one for the real distribution (1%).

In specification 2, 7% are unmatched (mostly men and women with low levels of education). There are fewer couples in which the wife has three educational levels more than the husband and where the wife is older than the husband. In specification 3, 14% are unmatched: Men with lower levels of education have the highest proportion of unmarried as well as highly educated women (undergraduate and graduate degrees). Again, there are fewer couples in which the wife is older and barely any couples in which the wife is more educated. The results for specifications 2 and 3 highlight that parents prefer matches in which the husband has the same level as the wife or is more educated, and parents prefer a daughter-in-law who is younger than their son.

4. Weighting the General Population

Men and women who married in the years 2012–2016 are clearly different from the men and women that are represented at the public park in the QSAMPY sample. In particular, QSAMPY subjects are mostly urban, older, and more educated. In order to improve the comparison between the two samples, we first use only couples in the CFPS that indicate that they live in an urban area (57% of households).[29] Appendix B figure 5 illustrates the results in the second row. Though urban couples have a higher propensity to have the same age and the same education, the differences between all households and only urban households are barely visible. The simulated matches are also very similar to the one using all households.

To make the actual population more similar to the QSAMPY sample according to age and education, we use propensity score weighting after we run the simulation. The weights are calculated based on a logit regression that has as dependent variable an indicator that equals 1 if the observation is from the QSAMPY sample and 0 if it is from the general population. Education and age are used as regressors.[30] Appendix B figure 5 illustrates the results weighted for the characteristics of women represented by their parents in the third row and weighted for the characteristics of men represented by their parents in the fourth row.

[29] Unfortunately, we do not know the location before marriage and the household registration status for the spouse, only the respondent.

[30] Education in levels as a linear and squared term and a spline-based smooth function for age.

Men who are similar to those in the QSAMPY sample are more likely to marry a wife who is younger and less educated than them, compared with other men in the overall population. The simulation does not predict this for education, where they are predicted to marry someone with the same level of education. For age, the weighting shifts the peak of the simulated distribution even further to the right, where husbands are much older than their wives. Therefore, while it seems that older men have a higher likelihood of marrying younger wives, this is much less pronounced in the general population than is predicted by our preference estimates.

Women who are similar to those in the QSAMPY sample are more likely to marry a husband who is less educated than them, compared with other women in the overall population. This is predicted by the simulations as well, though more strikingly. They have the highest propensity to marry someone of their own age, the same as other women in the overall population. The simulations, however, do not capture this and predict more couples with an older husband than the wife.

Overall, adjusting the simulations to reflect the different proportions of individuals with certain age and education profiles in our sample compared with the general population does not remove the most important discrepancies between the actual outcomes and those predicted by parental preferences. It is possible, of course, that our sample is unrepresentative in unobserved rather than observed characteristics (linked, e.g., to the fact that the older individuals have family members searching for them because they are perceived to have been unsuccessful searching for themselves). It is hard to know what we could realistically do to take this possibility into account, but it suggests a degree of caution in drawing strong inferences from our results.

VI. Discussion: What Do Young People Want and What Do Parents Accept?

Parental preferences predict fairly homogamous matching according to educational levels, but they predict fewer marriages with more educated wives than with more educated husbands. Furthermore, parental preferences would predict there to be more couples where the husband is 1–3 years older than there actually are. In this section, we contrast parental preferences with preferences of a student sample that was collected in the same city but is substantially different in its age distribution and more diverse in upbringing and ethnicity. We also investigate what parents state they would accept in terms of education and age and contrast the stated preferences to their profile choices and the actual marriage distribution.

A. Students' Preferences

Nearly all parents and relatives at the Green Lake Park came without the unmarried person, and to allay any concerns about confidentiality, we decided not to request contact details of the unmarried person that might have enabled us to contact them directly. To have an idea about the preferences of young individuals who face the same profiles as the parents, we therefore ran the survey at a local university. We would like to know where the preferences overlap and where they do not and to see whether the differences can explain the gap between simulated and observed marriage outcomes. Students' preferences are described in detail in appendix B. Appendix A table 2 shows some summary statistics, while appendix B table 9 displays the preference estimates.

Female students display the same increasing preferences for men's education, as do parents with tertiary-educated daughters. A male profile with an undergraduate degree is nearly 20 percentage points more likely to be selected than a male profile with a high school degree. They also have preferences for real estate and high income.

Male students also display similar preferences to those of parents of tertiary-educated subjects. Female profiles with an undergraduate degree have the highest likelihood of being selected by male students, on average, the same as by parents.

Using students' preferences for the simulation (specification 1), they also predict a high degree of homogamy regarding educational levels—identical to parents in specification 1 (see app. B fig. 13*a*). Yet they also predict the same share of matches where the man is more educated than when the woman is more educated, as is observed in the actual outcomes.

Female students display the same preferences for a partner with the same age, as do parents for their daughters. Male students have a dislike for older women, as parents do, but they do not have a significant preference for a younger partner. The age preferences are illustrated in appendix B figure 8*a* and 8*b*. Male students are seemingly indifferent between a partner that has the same age, or is up to 3 years younger, but then the predicted likelihood to select a profile drops. Indeed, the likelihood curves for male and female students are nearly mirror inverted, which is not the case for parents searching on behalf of much older men.

This difference in preferences leads to the peak of the age distribution to be one in which the husband and the wife having exactly the same age when using students' preferences for the simulation (see app. B fig. 9). The peak in the students' simulated distribution, unlike the simulated distribution from the parents' sample, is therefore in line with the observed marriage distribution.

B. Accepted Age and Educational Levels

We also asked the parents what age levels they would accept for their child-in-law. Appendix A figure 7*a* illustrates the lower and the upper age levels that parents indicated they would accept, according to the age of the unmarried subject. It also includes information on actual marriages in the general population. Indeed, parents with sons in their mid-20s accept daughters-in-law that have the same age than their son. Only when the son is in his mid-30s do parents state that they would not accept daughters-in-law that have the same age. For sons-in-law, parents always accept men who have approximately the same age as their daughter.

To investigate if these stated acceptance levels are indeed strict, we cross them with the profile selection data. We observe that 26% of the profiles shown to parents have an age below their lower stated accepted age level. Of those, 27% are still selected for a meeting. Parents searching on behalf of their son are more lenient (41%) than parents searching on behalf of their daughter (26%). Meanwhile, 32% of the profiles indicate an age that is above the upper stated accepted age level. Of those, 23% are still selected for a meeting (21% for male subjects, 25% for female subjects). This suggests that while the stated acceptance levels bear some weight, they are not always enforced.

To summarize, we find that while parents prefer their son to marry a younger wife, they accept a wife with the same age, until their son is older. Since most people get married in their mid-20s, most marriages form between a husband and a wife who have no or a small age gap and are acceptable to the parents in our sample. Yet the fact that this is the actual outcome might be better explained by taking into account the preferences of the younger, unmarried individuals—where men display no significant preferences for a younger wife. However, based on these data sources, we do not know whether male individual preferences change with their age as well and converge toward the parental preferences we find in the public park sample.

Appendix A figure 7*b* illustrates the same acceptance limits for education. It illustrates that parents have a dislike of sons-in-law with less education than their daughters and state that they would not accept such a match. Marriages between a husband and a wife that have the same education are accepted by both sides. At the same time, we find that the upper limit of parents searching on behalf of a man is almost never binding—they usually accept a daughter-in-law who is more educated than their son. The only exception is that for sons with a university undergraduate degree, some parents do not accept a woman who has a postgraduate degree.

The acceptance limits also underline the finding that the parents in the public park sample want their son-in-law to have at least as much education as their

daughter, which is not always the case in the observed marriage outcomes. Again, stated acceptance levels should not be interpreted as being always binding. We observe that of the 26% of profiles that have an educational level below the lower stated accepted educational level, 19% are still selected. Of those that have an educational level above the upper stated accepted educational level (only 8.5%), 30% are still selected.

VII. Conclusion

This paper investigates parental preferences and their influence on marriage patterns, using data from China. Although the explicit involvement of parents in marriage decisions is more common in China than in Western countries, parental influence on decisions about marriage (as well as about education and other premarital investment such as real estate ownership) are important in Western countries as well. It is important to know whether parental preferences constrain the marriage patterns of young adults in ways that run counter to those adults' own preferences or their long-run interests. In particular, we are concerned to know whether there are reasons to fear an aversion to "overeducated" women on the part of parents of potentially marriageable men.

The novelty of this paper is that it explicitly discusses parental preferences rather than seeking to infer them from outcomes. It does so by interviewing parents and other relatives that are currently actively searching for a spouse for their adult child. Parents see themselves as agents for their children, though they also indicate wanting to have grandchildren and someone to take care of them when they are older.

Overall, although we see some evidence of the potential reduced marriageability of educated women, this is not for the usually stipulated reason, which is aversion to "overeducated wives." Rather, we see evidence of an aversion to "undereducated husbands." However, we also find that these preferences do not seem to be typical of the observed patterns of marriage in national survey data. In the observed distribution, matches in which the wife is slightly more educated than the husband are as common as matches in which the husband is slightly more educated. Finally, the preferences based on a local student sample diverge from parental preferences in ways that better explain the observed marriage patterns.

Some divergences between parental and child preferences appear in the age dimension as well. Parents seem to have a preference for an age gap that students do not, and this preference predicts marriage patterns that are different from the observed marriage patterns. This could be due to age preferences changing with the age of the unmarried subject: parents mostly search on behalf of an unmarried subject that is older than the students. Yet allowing for

age-specific preferences and weighting the general population to make it more similar to the interviewed population helps to explain this discrepancy. It is also possible that there is a difference between generations, consistent with suggestions in the literature, as discussed above. One possibility, up for future research, is that the younger generation is more in contact with other individuals of the opposite sex of the same age due to the increase in time spent on education. However, we also observe that parents accept daughters-in-law of the same age as their son when their son is in his 20s to mid-30s. As most marriages occur at this time, the observed marriages seem not necessarily preferred but acceptable to parents.

In short, divergences between parental and child preferences do exist, but they are neither very major nor very influential in explaining observed outcomes, and fears that overeducated women may face diminished marriage prospects are—on our evidence—less serious than has recently been claimed. It therefore seems reasonable to suggest that parental preferences are for now not an obstacle but rather an encouragement to investments in education on the part of girl children. Yet while these preferences predict current matching patterns well and overlap substantially with students' preferences, it raises the question of what will happen if women's educational attainments overtake those of men. This might matter not just because they could be constrained directly by preferences about the education levels of wives but also indirectly by preferences on age levels, since more educated wives tend to be older when they enter the marriage market.

The Chinese population that recently married is one where women and men have very similar educational attainments, yet according to the UNESCO Institute for Statistics, since 2016, the proportion of women enrolled in tertiary education has been drawing ahead of that of men.[31] For now, marriages between women and men where the woman is more educated are common. Yet if the outside options for educated women improve, they may decide to delay marriage or stay unmarried, putting potential strains on marriage markets in the future.

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