Research Article

Singlehood in contemporary Japan: Rating, dating, and waiting for a good match

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Abstract

BACKGROUND
Late age at marriage and rising rates of singlehood increasingly characterize East Asian societies. For Japan, these are major contributors to the very low birth rate.

OBJECTIVE
We analyze two unique data sets: dating records covering a two-year period from one of Japan's largest marriage agencies and in-depth interviews with 30 highly-educated Japanese singles. The longitudinal nature of the quantitative data allows us to test hypotheses about how single men's and women's preferences for partners' characteristics adjust over time. The qualitative data provides a more fine-grained look at Japanese singles' partner preferences.

METHODS
We employ fixed-effects regression models to analyze Japanese men's and women's preferences for the relative and absolute education, income, and age of potential marriage partners.

RESULTS
Both the quantitative and qualitative data suggest that Japanese women continue to highly value men's income-earning capacity. Men, in contrast, value a partner with moderate income-earning potential. Women's and men's preferences for partner's education are somewhat weaker, and women broaden their educational preference over time.

CONCLUSION
Japanese men's and women's preferences for a potential partner's characteristics are largely consistent with Becker's theory of gender-role specialization. But we also find

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evidence consistent with Oppenheimer's expectation that men are coming to value women's income-earning capacity more highly than in the past.

CONTRIBUTION

We use a unique Japanese data set featuring dating records over a two-year period to examine the appropriateness of theories of marital sorting proposed by Becker and Oppenheimer. Our quantitative analysis is complemented by in-depth interviews with Japanese singles.

1. Introduction

The issue of who marries whom has long attracted the attention of family sociologists. An extensive literature documents patterns of assortative mating in the United States and other postindustrial countries, generally based on data on the relative characteristics of spouses (Esteve et al. 2016; Fukuda 2013; Fukuda, Raymo, and Yoda 2019; Ono 2003; Raymo and Iwasawa 2005; Sweeney 2002; Sweeney and Cancian 2004). How partners are matched on features such as age, education, and income has important consequences for marital stability (Bumpass and Sweet 1972; Kippen et al. 2013), the intergenerational reproduction of social and economic inequality (Breen and Salazar 2011; Ciscato and Weber 2020; Eika, Mogstad, and Zafar 2019; Schwartz 2010, 2013), and child outcomes (Edwards and Roff 2016). Yet our understanding of the process through which individuals are matched remains limited. While recent literature on online matching has enriched our understanding of the preferences of men and women as they navigate the search process, we know little about the degree to which they either maintain or adjust their initial preferences as their search for a partner progresses.

A better understanding of the mate search process and heterosexual men's and women's preference rigidity or adjustment holds particular importance for Japan and other countries in East Asia that are experiencing rising age at marriage, increasing rates of singlehood, and a low incidence of cohabitation (Eurostat 2015; Raymo et al. 2015). A quarter century ago, marriage and parenthood were 'givens' in the life cycle of young adults in Japan, and the male breadwinner–female caregiver model was widely accepted as the norm for marriage (Brinton 2001; Kan and Hertog 2017; Ochiai and Molony 2008; Qian and Sayer 2016). But rates of never having married have increased substantially in the past few decades. Local observers have turned to a number of hypotheses to explain this, ranging from women's greater career orientation to an increasing shortage of 'marriageable men,' defined by male-breadwinner norms.

Recent research has demonstrated that the Japanese marriage market increasingly displays contrasting dynamics at the upper and lower ends of the social class structure

(Fukuda, Yoda, and Mogi 2019). Japan is one of the few postindustrial societies that continued to demonstrate until very recently a negative association between a woman's earnings and her probability of marrying (Raymo and Iwasawa 2005; Retherford, Ogawa, and Matsukura 2001); the same was true for the relationship between women's education and her marriage probability (Raymo and Iwasawa 2005; Tsuya 2006). This was consistent with the strong tendency toward Japanese women's status hypergamy and reflected the highly gendered division of labor in both home and workplace. Recent studies, however, show that the negative educational gradient in Japanese women's marriage disappeared by 2005 and a positive gradient emerged by 2009. This change has been driven by increased female hypogamy among highly educated women and declining female homogamy among less-educated women (Fukuda, Raymo, and Yoda 2019).

The present paper contributes to our understanding of marital sorting in Japan by drawing on two unique data sources that allow us to further examine mate search dynamics among the highly educated in particular. First, we draw on dating records from one of Japan's largest marriage agencies over a two-year period to analyze men's and women's initial preferences regarding the education, income, and age of a potential spouse and to track how these preferences change as the mate search process unfolds. Second, we turn to in-depth interviews with highly educated urban Japanese men and women in their mid-20s to early 30s to analyze how they discuss the prospect of marriage and the characteristics they value in a potential spouse.

2. Background: Theories and research on marital sorting

2.1 Theories of marital sorting

Becker's (1973) and Oppenheimer's (1988) classic pieces on the marriage market and marriage timing propose somewhat different models of partner choice. Becker argues that individuals aim to maximize their gains from marriage through negative assortative mating on economic traits such as income and positive sorting on nonmarket traits. The prediction that couples will engage in negative assortative mating on income is consistent with Parsons's (1951) earlier theorization of the efficient division of labor in a family. But unlike Parsons, Becker does not explicitly incorporate a consideration of normative gender roles into his theory of why men and women tend to specialize either in market or nonmarket work. Instead, he focuses on how men's and women's relative comparative advantage leads them to specialization. His early articulations of this framework (1973) tend to imply that women have a biological propensity to specialize in housework and childcare, although in later renditions of the theory he clarified that women's comparative

advantage in home-based 'production' could be due to a number of factors including gender discrimination in the labor market (Becker 1985).

In contrast to the negative assortative mating Becker predicts with respect to partners' income, he sees education as a trait lending itself to positive assortative mating. He writes, "The gain from marriage also depends on traits, such as beauty, intelligence, and education, that affect nonmarket productivity as well, perhaps, as market opportunities" (Becker 1973: 822). Thus while Becker acknowledges that education may affect "market opportunities," his emphasis is principally on education as a trait on which potential partners tend to be similar. He offers support for differentiating between marital sorting by education and income by citing research that documents a strong positive correlation between partners' education even after age and wage rates have been controlled.

In sum, Becker's framework (1993) predicts that men and women will seek a partner with similar education (positive assortative mating) but that women will on balance prefer higher-income men. Given the assumption of gender-role specialization within marriage, higher-income women might forgo marriage because of their low expected gains from marriage. It is also possible that women with a strong career orientation are viewed as less desirable by high-income men, who may feel that they can benefit more from a potential wife's specialization in home-based production (housework and childcare).

While Becker emphasizes gender-role specialization based on men's greater relative earning power and women's specialization in nonmarket work, Oppenheimer (1988) suggests that as men's early career trajectories become more uncertain and as women increasingly enter the labor market, men may come to value women's income more highly. This constitutes a challenge to Becker's expectation that men's but not women's earning power is an asset in the marriage market. Moreover, Oppenheimer differs from Becker in viewing education mainly as a proxy for earning power rather than as an indicator of similar lifestyles and hence as a mechanism for positive assortative mating (e.g., Oppenheimer 1988: 579). Consequently, she expects both men and women to value high educational qualifications and high income in potential marriage partners. Oppenheimer's approach predicts that less-educated, low-income men and women will be less marriageable than their more highly qualified, higher-earning counterparts.

To date, testing the predictions of Becker's and Oppenheimer's theoretical frameworks has been difficult. Our aim in this paper is not to attempt to conclusively adjudicate between the two frameworks. Rather, we seek to explore how new data sources can illuminate the nuances in Becker's and Oppenheimer's arguments, especially for the case of Japan.

2.2 Empirical research on marital sorting using survey data

Sociologists have typically inferred partner preferences from data on the relative characteristics of spouses (Blossfeld 2009; Kalmijn 1998) or from surveys that ask individuals to report their preferences (Buss et al. 2001; South 1991). A substantial empirical literature has documented positive marital sorting by education and income in many postindustrial countries (Fernandez, Guner, and Knowles 2005; Mare 2016). But the use of survey data on outcomes (i.e., marriage) in most studies renders it impossible to untangle the dynamics of preference formation and adjustment during the mate search process. Research on individuals' reported preferences is therefore of value.

There is some evidence indicating that young men's preference for women's income-earning capacity has increased in the United States, consistent with Oppenheimer's expectation (Boxer, Noonan, and Whelan 2015). At the same time, norms dictating that the husband be the primary breadwinner appear to persist even in relatively gender-equal societies such as the United States (Dernberger and Pepin 2020; Killewald 2016). Single American women have been found to avoid signaling professional ambition if they know that their survey responses will be made public; this finding does not apply to married women (Bursztyn, Fujiwara, and Pallais 2017). This has been interpreted as evidence of single women's desire to avoid portraying themselves as highly career oriented.

In addition to focusing on education and earnings, researchers have considered patterns in the relative age of partners. Research in a number of societies documents a highly gendered pattern whereby men prefer younger women, a preference that appears to become stronger as men age. Conversely, women tend to be attracted to men whose age is similar to or higher than their own (Bergstrom 2018; Buss 1989; Dunn, Brinton, and Clark 2010; Ní Bhrolcháin and Sigle-Rushton 2005; Schmitz, Skopek, and Blossfeld 2011).

2.3 Empirical research on mate search using online data

In recent years, social scientists have gained access to online data that allow closer observation of the revealed preferences guiding men's and women's search for a mate (e.g., Hitsch, Hortaçsu, and Ariely 2010; Lee 2008; Lin and Lundquist 2013; Potarca and Mills 2015; Yu and Hertog 2018). This research has reaffirmed assortative mating by education in the United States (Fisman et al. 2006; Hitsch, Hortaçsu, and Ariely 2010) and Germany (Skopek, Schmitz, and Blossfeld 2011). Hitsch, Hortaçsu, and Ariely (2010) also find that both men and women in the United States prefer to partner with individuals with the highest income.

Research that uses dating records has the advantage of accessing real-world choices that are not confounded by respondents' tendency to offer socially desirable answers when facing hypothetical scenarios. Studies of online dating (Feliciano, Robnett, and Komaie 2009; Hitsch, Hortaçsu, and Ariely 2010; Lin and Lundquist 2013; Skopek, Schmitz, and Blossfeld 2011) suggest that the ongoing reevaluation of mate preferences is likely to be a key mechanism enabling individuals to find a suitable match, as they iteratively assess their preferences as well as their own desirability (Todd, Billari, and Simão 2005).

In searching for a mate, a person "encounters options in a temporal sequence, appearing in random order, drawn from a population with parameters that are only partially known ahead of time" (Todd and Miller 1999: 288). While searchers can judge the attractiveness of a given potential partner, they cannot be sure whether they themselves will be desirable to another person until they try to approach him or her. Given these constraints, individuals searching for a partner face three options. First, they can choose to stick to their preferences and either realize them or remain single. In this scenario, they do not modify their search behavior over time. A second option is to continuously adjust their preferences 'downward' until they find a person who accepts them. Finally, they can opt to combine these strategies by lowering their preferences to a certain 'reservation' partner quality. If they are unable to secure a match with a partner who meets this reservation quality, they will choose to remain partnerless. Understanding preference adjustment over time can thus provide evidence of the compromises men and women make in their mate search, shedding light on whether fundamental mismatches in partner preferences between genders lead to a higher rate of not partnering.

Many behavioral models of mate selection assume that people modify their preferences based on their experiences in the marriage market (Schwartz 2013). Empirical research on partner preferences in local marriage markets and over the life course provides evidence that people learn through experience in looking for long-term mates (e.g., Pollet and Nettle 2008; Skopek, Schmitz, and Blossfeld 2011). However, the limited availability of data on the partner search process means that there is little systematic evidence on whether and how much people adjust their initial preferences. Moreover, it is not known whether there are systematic differences between men and women in their willingness to modify partner choice strategies. Our study of preference adjustments in Japanese marriage partner searches over a window of time provides insight into this. We turn now to the Japanese context.

3. The Japanese context: Continuity and change in partner search and marriage patterns

Japanese marriage patterns have exhibited both significant change and notable continuity in recent decades. While marriage has become less of a normative imperative in recent years, close to 90% of young Japanese adults continue to state the wish to marry (National Institute of Population and Social Security Research 2015). Nevertheless, delayed marriage and increasing rates of singlehood are now the principal reasons for Japan's very low birth rate (Retherford, Ogawa, and Matsukura 2001).

Rates of being unmarried have increased dramatically in Japan in recent years. In 1975 just 5.3% of Japanese women age 35 to 39 were never married. This increased to 7.5% in 1990, 13.9% in 2000, and 23.9% in 2015 (United Nations 2017). Given that rates of cohabitation in Japan remain many orders of magnitude lower than in the United States and many European countries and that less than 5% of all Japanese births occur outside of marriage (Raymo et al. 2015), the low Japanese marriage rate has a significant negative impact on fertility.

Late marriage and the increasing rate of singlehood in Japan render the study of single men's and women's partner preferences highly important. In addition, Japan is an ideal context in which to test theories of marital matching. The mate search literature has focused heavily on Western societies, and Japan represents a notable contrast. It is a much more gender-inegalitarian society, with a sharply gendered household division of labor and an emphasis on women's intensive mothering role that has changed little over the past few decades (Hertog 2020; Hertog and Kan 2019; Tsuya et al. 2012; Tsuya, Bumpass, and Choe 2000). Empirical studies demonstrate that Japanese men contribute fewer hours of housework than men in nearly every other postindustrial society (Fuwa 2004; Hook 2006). Men's mean housework share stands at just 15%, less than half that in many other OECD countries (OECD 2020).

The persistence of highly gendered family norms in Japan is juxtaposed against two significant changes in men's and women's economic participation and earning capacity over the past three decades. First, an increasing proportion of entry-level jobs in the Japanese labor market are temporary or precarious jobs, characterized by short-term contracts with little to no job security or benefits (Brinton 2011; Genda 2001; Osawa, Kim, and Kingston 2013). The contraction in the number of secure full-time jobs and the expansion of contingent work has had a disproportionately negative impact on the younger generation, especially the less educated – those who did not pursue any form of higher education after graduating from high school (Brinton 2011). Recent research has demonstrated that holding an irregular job significantly lowers the probability of marriage for both young men and women. The increasing tenuousness in young Japanese men's capacity to support a family clashes with norms of male breadwinning. Reflecting

this, the negative effect of having a contingent job on the transition to marriage is stronger for men than for women (Piotrowski, Kalleberg, and Rindfuss 2015; Raymo and Shibata 2017).

Second, the stagnant economy together with the promise, realistic or not, of lowered gender barriers in the labor market due to the passage in the mid-1980s of the Equal Employment Opportunity Law and its subsequent revisions led more young Japanese women to pursue higher education in the 1990s. By the early 21st century, Japanese women's rates of advancement to higher education (including junior college and university) exceeded men's for the first time (MEXT 2017). But women's greater participation in the public sphere (i.e., education and employment) has not been matched by men's greater participation in housework and childcare (Brinton and Oh 2019).

In sum, the continued desirability of marriage in Japan and the very close link between marriage and childbearing mean that the majority of single men and women are engaged in the search for a marriageable mate. At the same time, long-standing cultural norms of female status hypergamy are clashing with ongoing changes in men's and women's education and work patterns. Recent analyses and government surveys suggest that continuous labor force participation after marriage is slowly becoming a more normatively accepted pattern for Japanese women (National Institute of Population and Social Security Research 2015). Along with the difficulties young less-educated men face in securing stable full-time jobs, this raises the question of whether male and female preferences for female status hypergamy are persisting. Moreover, the extent to which the growing number of highly educated women is producing a marriage squeeze for such women (and conversely, a marriage squeeze for men with low educational qualifications) depends at least in part on whether male and female partner choices are fixed or undergo adjustment during the process of mate search.

4. Hypotheses

We employ data on the preferences of Japanese men and women registered in a large marriage agency to test several hypotheses. A particular feature of the data is that it is longitudinal, allowing us to examine how men's and women's partner preferences adjust with dating experiences over a two-year period. We complement this analysis with 30 in-depth interviews with urban, native-born, highly educated Japanese singles that ask about their views toward marriage and the desirable characteristics of a potential spouse. Our hypotheses are as follows:

1) Consistent with Becker's specialization model and the continued dominance of the male-breadwinner norm in Japan, women will express a strong preference

for men with higher incomes than their own. We expect women to retain this preference as they continue the partner search.

2) Becker and Oppenheimer both predict complementarity in partners' education. However, Becker's emphasis on gender-role specialization and also on education as a nonmarket trait suggests that women are motivated to find a partner who is at least as educated as they are, whereas men may be more apt to favor a partner with a similar or lesser amount of education than their own. Given Becker's assumption that women generally specialize in home production, women's education will not be as highly valued as men's for its income-generating potential. As noted earlier, Japan's high degree of gender inequality would seem to constitute a classic case of such gender-role specialization. (We realize, however, that even with preference data we are unable to judge the degree to which Japanese women's education is valued for its positive potential for 'home production,' especially in terms of investment in children.)

The movement toward marital hypogamy among Japanese women suggests that women's preferences may be changing. Nevertheless, this change is limited to the highly educated and is quite recent, so we expect women's preferences to remain somewhat more consistent with norms of hypergamy (Fukuda, Yoda, and Mogi 2019). But because the supply of highly educated men is limited, we expect some relaxation of women's educational preferences as they continue their search.

3) Consistent with Oppenheimer's emphasis on the increasing uncertainty of the transition to stable employment for both genders in a postindustrial society, we expect to see some valuation of women's income by men. This prediction is also based on the increasing commonality of dual-earner couples in Japan. However, we qualify our expectation in that we expect men's preference to be for some – but not high – earning capacity on the part of a future spouse. The strong normative expectation in Japan that wives perform nearly all the housework and childrearing responsibilities will render men's desire to marry a woman who is committed to a career with high earnings more unlikely. We do not expect men's preference for women's moderate earning capacity to change as their search progresses.

4) We expect to see the 'standard' preference among women for a partner slightly older than themselves and a preference among men for a younger partner. We do not have expectations about stability or change in these preferences as people continue their search.

5. Data

5.1 Qualitative data

Our qualitative data come from structured in-depth interviews conducted with urban, single, native-born, highly educated Japanese women and men age 24 to 35. The interviews (N = 30, 15 men and 15 women) were carried out in 2012 with individuals who had completed some form of higher education (two-year technical school, junior college, university, or above). The majority of interviewees had completed university. These interviews provide a window into how highly educated young Japanese think about marriage and the characteristics they desire in a potential partner.

5.2 Quantitative data

Reliance on modern matchmaking services has become more and more common in contemporary Japan. In 2005, around 20% of singles aged 20 to 44 used some form of assistance (organized speed dating, matchmaking through marriage agencies, or online dating sites) in their partner search (METI 2005). Our quantitative data come from one of the largest marriage agencies in Japan. The data include member characteristics as well as a detailed log of members' interactions with each other over a two-year period (January 2006–December 2007). The agency targets a broad population, advertising in venues such as commuter trains and music stores. As a result, membership is not limited to a particular region or social group.

The marriage agency data offers several advantages for studying marriage market processes. First, the risk of individuals misrepresenting their attributes, a typical problem in dating agency data (Schmitz, Zillmann, and Blossfeld 2013), is minimized because the agency verifies several individual characteristics in order to forestall the possibility of deception between potential partners. These characteristics include the individual's highest level of completed education, name of the school where this education was completed, income, and employer's name. Individuals are allowed to join the agency only after having a one- to two-hour in-person interview. This serves as a further check on new members' truthfulness in reporting observable characteristics such as age, height, and weight.

The second advantage of these data is that the agency screens out people interested in only short-term dating relationships. This is important because empirical research suggests that long-term and short-term mating goals are often at odds (Buss 1998). Having individuals with both types of goals is common in data from matchmaking

platforms, making it difficult to study the effects of individual characteristics on marriageability.

Third, the agency places a cap on the number of potential partners an individual can approach through computer matching and profile booklet search (the two most common search methods). This ensures that agency members maintain a realistic attitude toward partner search. Evidence suggests that having too many potential date options can adversely affect the search process (Lenton, Fasolo, and Todd 2010).

We utilize data on members active in 2006–2007. We define activity as either approaching potential partners or being approached. The agency requires that individuals be at least 20 years old to join the service; 95% of members are 20 to 50 years old. Because the right-hand tail of the distribution is sparsely populated, we cap maximum age at 50 years old. We restrict the sample to men and women who have never married and do not have children. All men in the sample have a regular source of income, as this is a criterion set by the agency. To verify individuals' income, the agency requires submission of a tax return form or a letter from one's employer.

Individuals learn about potential partners in a number of ways. Three approach methods (computer matching, profile booklet search, and intranet search) account for approximately 95% of the contacts people make with each other. We therefore limit our analysis to those methods. Computer matching (accounting for nearly 40% of date offers) is based on the partner characteristics that individuals specified as preferences when they signed up with the agency, including potential partners' income, age, and area of residence. Each month the agency randomly selects up to six members who match a given member's specified criteria, sending the profiles to the member. In addition, every month the agency distributes a booklet with summary profiles for all individuals who joined over the past month. Each member can contact up to three potential partners from the booklet. This method is relied on in 50% of approaches. Finally, members can pay an additional fee to search through the member database via the company's intranet. This method is used in 6% of approaches.

We focus mainly on the responses of recipients of dating offers (individuals approached by other dating agency members). In this stage of the search process, members' decisions are guided solely by their own preferences and their expectations of a potential partner. Likewise, because individuals receiving date offers have already been positively evaluated by the individuals approaching them, issues of self-censorship due to lack of self-confidence, while always possible, are not likely to arise. That is, approached individuals are unlikely to hold back from attractive potential partners due to a fear of rejection. Once a date offer is made to a potential partner, the recipient can either accept or reject it. If accepted, the individuals can start dating.

5.3 Quantitative sample representativeness

An obvious concern with marriage agency data is the representativeness of the individuals who register with the agency. To check for possible sample bias, we compare the characteristics of agency members with those of a nationally representative sample of singles surveyed in 2005 (close to the time of our data collection) by the Japanese Ministry of Economy, Trade, and Industry. As discussed more fully in Appendix 1, marriage agency members are generally better educated, have higher incomes, and are slightly older than the population of singles in the national survey. These characteristics of marriage agency members represent two particular advantages for our analysis. First, the fact that they are better educated and have higher average earnings than the general population of singles complements our analytical focus on the mate search process for this particular population of singles. Second, we consider it an advantage that the majority of men and women in our sample are age 30 or older. As education levels have risen and the transition to adulthood has lengthened in postindustrial societies, individual earning prospects and career trajectories are arguably becoming clear at ever-later ages (Oppenheimer 1988). Given the age distribution of the marriage agency sample, individuals should be able to estimate potential partners' future earnings with greater certainty than younger people. This may increase the robustness of their preferences.

5.4 Ethical issues in the use of quantitative data

The marriage agency that shared their customer data with us routinely uses its data for in-house research, sometimes in cooperation with Japanese university researchers. The agency takes several steps to ensure anonymity prior to allowing the data to be used for research. Written consent is obtained from all incoming customers, and the agency removes from the sample those customers who do not consent to having their information used for research, which the agency assured us is very rare.

6. Data analysis: Marriage agency data

6.1 Variables

In analyzing interactions, we use the terms 'bidder,' 'target,' and 'bid.' Bidder refers to the individual making a date offer, target refers to the individual being approached for a date, and bid refers to a date offer that is made or received. By organizing the data based on the targets who received dating offers from bidders, we investigate targets' behavior

in accepting the offers. Our dependent variable is a binary measure of whether an individual accepted a bid she or he received.

We use a series of relative measures indicating whether the bidder's characteristics (education, income, and age) are higher or lower than the target individual's. We classify individuals into five categories of completed education: junior high school, high school, post–high school vocational schooling or junior college, university, and graduate school. We consider bidders' and targets' ages to be the same if their respective ages are no more than two years apart. Bidders' and targets' incomes are considered equivalent if the target's income is no more than 15% higher or lower than the bidder's. Income is measured as yearly income, calculated at the 2007 exchange rate of 118 Japanese yen to the US dollar. To analyze whether targets' preferences change over time, we create a duration measure reflecting the number of days since the target joined the marriage agency. Because this variable is highly skewed, we log transform it.

We control for the number of bids the target has received and also the number of bids she or he sent before receiving a new bid, thereby controlling for the overall activity level of each target.

6.2 Analytical strategy

Because most agency members receive multiple dating bids, there are multiple observations for each individual. We use individual fixed-effects logit models to analyze how targets respond to dating bids from bidders with various characteristics. An important advantage of fixed-effects models is that they analyze only within-individual variation. Instead of comparing behavioral patterns across individuals, we are able to analyze how an individual responds to offers from different bidders. In addition, fixed-effects models control for intrinsic and stable unobserved characteristics such as family background (Gelman and Hill 2007). Although we cannot completely rule out unobserved heterogeneity among bidders, we control in all models for bidders' observable characteristics. These include the absolute values of bidders' height, weight, age, income, and education.

7. Findings from marriage agency interactions

7.1 Descriptive findings: Individual preferences for dating partners

We first explore men's and women's preferences for a partner's absolute education and income, irrespective of the comparison between themselves and the potential partner. Our

record of member interactions spans a two-year period. But because some individuals joined the agency prior to or after the starting date of our observations and some left the dating agency during the two-year observation period, only a certain number of members have a full two-year history of interactions. In order to describe the 'average' dating experience of individuals, we calculate the mean and median number of dating offers made, received, and accepted over a one-year period for each individual for whom we have an interaction history of at least one year. That is, we start at the date an individual joined the dating agency (or, if they joined before the two-year period of observation began, the start date of the period). We then calculate statistics on their dating activity across a full year. In this way, we control the period of observation for all individuals. We do this only for the purpose of calculating descriptive statistics. In all subsequent analyses we utilize dating records over the full two-year period and control for the duration of individuals' exposure to dating interactions.

Table 1 shows that women make fewer dating offers than men and are more selective in the ones they accept, similar to the findings of prior research (e.g., Lin and Lundquist 2013). On average, men made 1.7 times more date offers than women (66 versus 39). Although women outnumber men in the sample, the average woman received more than twice as many offers (33) as the average man (14). Women accept an average of one of every nine dating offers compared to men's average acceptance of one of every three offers.

Table 1:   Dating activity measures for male and female members, one-year period[a]

	Females	Males
Number of date offers made		
Mean	39	66
Median	24	50
Number of date offers received		
Mean	33	14
Median	24	8
Mean number of date offers accepted	3.7	4.4
N (individuals)	9,832	7,825

[a] See text for explanation of why a one-year period was chosen.

Appendix 2 includes figures showing the number of offers made to and accepted by men and women at different education and income levels. Figures A-1 and A-2

demonstrate the attraction of men's absolute level of education and income: the higher, the better in terms of receiving offers. The appeal of women's educational attainment and income to potential dating partners is more nuanced. In terms of offer acceptance (Figures A-3 and A-4), women accept a much lower proportion than men, and their acceptance pattern by own education and income varies much less than men's. Further details are described in Appendix 2.

The descriptive results illustrate which absolute characteristics of potential dating partners are the most appealing to members of the other gender. But how do potential partners interact with each other based on their relative attributes? To analyze this, we turn to fixed-effects models. First, we analyze how a bidder's relative age, education, and earning power affect targets' probability of accepting a date offer from that bidder. Second, we analyze whether and how an individual's preferences are affected by the length of time spent searching for a partner. In this way, we assess whether men and/or women continue to search for a partner with characteristics that maximize the fit with their preferences or, on the other hand, broaden their strategy based on the duration of their search.
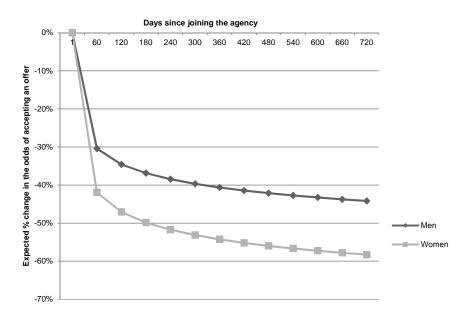
7.2 Effects of relative characteristics of bidders

Table 2 shows the fixed-effects logit analysis of the probability that an individual will accept a date offer from a potential partner, based on the relative characteristics of the two individuals. The baseline group for each variable is bidders with equivalent characteristics to the target. In Model 1 for men and Model 3 for women, we include measures for the bidder's education, income, and age relative to the target. We also control for the number of offers received and given out by the target (a measure of their activity level) and the absolute values for bidder's height, weight, age, income, and education.

The top row in Models 1 and 3 in the table shows that both men's and women's probability of accepting a date offer declines as time passes since they joined the marriage agency. At face value, this differs from the usual expectation that people search for a mate more desperately as time passes. Given the research setting of this study (potential partners' interactions through a marriage agency), our finding may indicate that people are more active at the beginning of their search and, as time passes, learn what to expect from the agency and in a sense find their own equilibrium. Figure 1 presents the change over time in men's and women's probability of accepting an offer. This figure shows that the odds of accepting an offer dramatically decline for both genders within the first two months after joining the agency. Women's odds of accepting an offer decline during this initial period more than men's.

Table 2:   Fixed-effects logit analysis: Probability of accepting a dating offer

	Men		Women	
	Model 1	Model 2	Model 3	Model 4
Duration (Log time since joining the agency)	-0.204 [-0.261, -0.146]	-0.253 [-0.333, -0.173]	-0.306 [0-.353, -0.260]	-0.291 [-0.352, -0.230]
Bidder: Higher education	-0.040 [-0.144, 0.064]	-0.189 [-0.593, 0.214]	0.007 [-0.046, 0.060]	0.085 [-0.062, 0.231]
Duration×Higher education		0.029 [-0.045, 0.102]		-0.012 [-0.037, 0.013]
Bidder: Lower education	0.041 [-0.031, 0.112]	-0.115 [-0.315, 0.084]	-0.426 [-0.490, -0.361]	-1.007 [-1.202, -0.813]
Duration×Lower education		0.029 [-0.006, 0.063]		0.108 [0.075, 0.142]
Bidder: Higher income	-0.089 [-0.259, 0.082]	0.032 [-0.797, 0.860]	0.343 [0.290, 0.396]	0.345 [0.124, 0.566]
Duration×Higher income		-0.022 [-0.170, 0.126]		-0.001 [-0.042, 0.039]
Bidder: Lower income	-0.061 [-0.128, 0.007]	-0.202 [-0.519, 0.115]	-0.467 [-0.578, -0.355]	-0.860 [-1.360, -0.359]
Duration×Lower income		0.026 [-0.031, 0.084]		0.078 [-0.016, 0.172]
Bidder: Higher age	-0.354 [-0.453, -0.256]	0.151 [-0.311, 0.614]	0.114 [0.072, 0.156]	0.357 [0.227, 0.487]
Duration×Higher age		-0.095 [-0.181, -0.010]		-0.043 [-0.066, -0.021]
Bidder: Lower age	-0.009 [-0.062, 0.044]	-0.148 [-0.332, 0.037]	-0.463 [-0.531, -0.395]	-0.526 [-0.801, -0.252]
Duration×Lower age		0.026 [-0.007, 0.058]		0.008 [-0.036, 0.053]
Popularity measures				
Number of past offers received	-0.007 [-0.008, -0.005]	-0.007 [-0.008, -0.005]	-0.007 [-0.008, -0.006]	-0.007 [-0.008, -0.006]
Number of past offers made	0.008 [0.007, 0.010]	0.008 [0.007, 0.010]	0.012 [0.010, 0.014]	0.012 [0.010, 0.014]
Bidder characteristics				
Bidder: Log height	10.23 [9.615, 10.844]	10.218 [9.603, 10.832]	10.322 [9.870, 10.775]	10.310 [9.857, 10.762]
Bidder: Log weight	-5.117 [-5.300, -4.934]	-5.116 [-5.299, -4.933]	-2.457 [-2.560, -2.353]	-2.460 [-2.563, -2.356]
Bidder: Log age	-4.052 [-4.349, -3.754]	-4.068 [-4.365, -3.770]	-4.673 [-4.897, -4.449]	-4.701 [-4.925, -4.477]
Bidder: Log income	0.579 [0.528, 0.630]	0.579 [0.528, 0.631]	1.922 [1.870, 1.974]	1.921 [1.869, 1.973]
Bidder: Education (omitted: HS or below)				
Vocational school	0.137 [0.070, 0.204]	0.136 [0.069, 0.203]	0.084 [0.021, 0.146]	0.093 [0.030, 0.156]
2-year college	0.357 [0.294, 0.419]	0.355 [0.293, 0.418]	0.162 [0.074, 0.251]	0.170 [0.081, 0.258]
4-year university	0.491 [0.403, 0.579]	0.489 [0.401, 0.577]	0.456 [0.375, 0.538]	0.448 [0.366, 0.529]
Graduate school	0.455 [0.276, 0.633]	0.449 [0.270, 0.628]	0.819 [0.711, 0.927]	0.799 [0.690, 0.907]
Number of target offers	100,059	100,059	308,636	308,636
Number of targets	7,208	7,208	9,463	9,463
Log likelihood	-37,912.728	-37,906.023	-73,015.337	-72,976.836

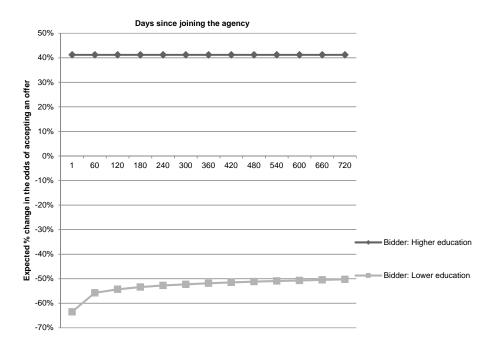*Note*: 95% confidence interval in brackets [lower bound, upper bound].

Figure 1:   Percentage change over time in the probability of accepting an offer, by gender

Comparisons of the bidder's and target's relative education, income, and age in Table 2 reveal that men and women have different preferences for potential partners' characteristics relative to their own. Model 1 shows that while men do not appear to have clear preferences for a partner's relative characteristics except for age (preferring not to accept date offers from women who are older than themselves), women show strong preferences for men's education, income, and age relative to their own (Model 3). Women appear quite averse to accepting dating offers from men who are less educated than themselves. Also, they strongly prefer men with higher income and avoid men with lower income than themselves. Women also appear to avoid men younger than they are and indicate a slight preference for dating men who are older than themselves.

Model 2 for men and Model 4 for women include interactions between search duration and each of the key measures of the bidder's and target's relative characteristics. Men's and women's strategies diverge somewhat as they continue to search for a partner. Men's preference for not accepting dating offers from women older than themselves becomes somewhat stronger. This could indicate men's increased sensitivity to a partner's age as they continue their search. Alternatively, this could be the result of

selection, as men who do not accept offers from older women may stay active in the marriage agency for a longer time than those who accept offers more indiscriminately. Women's preferences for a partner's relative characteristics appear to broaden more over time than men's do. Their dislike for men younger than themselves or earning less than themselves does not change with time. But their preference for men older than themselves declines. They also become more open to accepting a dating offer from a man with less education than their own. Figure 2 shows the change in the probability of women accepting an offer from men with a higher or lower educational level than their own. At first, women's odds of accepting an offer from a man with less education are 60% lower than their odds of accepting an offer from a man with an education equivalent to their own. This declines to 50% as time passes.

Figure 2: **Percentage change in women's probability of accepting an offer from men at different relative educational levels**

In sum, women appear to selectively broaden their criteria for a mate, moving toward a pattern that might be best characterized as satisficing with regard to a partner's

education and age relative to their own. However, it appears that women do not become more open to dating men whose income or age is lower than theirs. Finally, greater popularity, as measured by the number of offers received, makes both male and female recipients less likely to accept offers.

How do our initial hypotheses fare? Consistent with Becker's specialization prediction (Hypothesis 1), women prefer a partner who earns more than they do; this preference does not alter over the two-year window of our data. As Hypothesis 2 predicts, women have an aversion to dating men with less education than themselves. But such an aversion weakens over time. This is consistent with the fact that the supply of highly educated men is limited, so women eventually may need to satisfice with respect to their willingness to date a man with lower education than themselves. Hypothesis 3 predicts that men will value women's income-earning capacity, consistent with Oppenheimer. Note that this is not a prediction based on partners' relative earning capacity but rather on absolute earning capacity. Our descriptive findings (without controls) in Figure A-2 (in Appendix 2) indicates that men's preference for women's absolute income follows an inverted U shape. Table 2 shows that men's preference for women's relative income is not a strong one. Finally, Hypothesis 4 predicts that men would prefer dating women younger than themselves and women would prefer the reverse. While men's likelihood of accepting a dating offer from a younger woman is not evident in Table 2, their avoidance of dating women older than themselves is readily evident, and this tendency strengthens over time. In contrast, women's preference for dating older men weakens with time.

7.3 Robustness checks

While our data allow us to observe customer interactions during the 24-month period between January 2006 and December 2007, we noted earlier that our sample includes customers who joined the agency before as well as during the observation period. This could present a problem if newcomers to the agency behave differently than 'old timers.' For this reason, we conducted a robustness check to analyze the probability of accepting a date offer only for those members who joined the agency during the observation period of our analysis. We discuss this more fully in Appendix 3.

8. Findings from in-depth interviews

To supplement our analysis of dating records, we draw on structured in-depth interviews of single, native-born, highly educated urban Japanese men and women age 24 to 35

(N = 30) collected in 2012 for a related project. These qualitative data allow us to gain a sense of how Japanese singles view marriage, how they describe their partner preferences, and the underlining reasoning they articulate for their preferences. We focus particularly on preferences for potential partners' work and education, given that income and education are key variables in our analysis of the marriage agency data.

We note at the outset that all but 2 of the 30 interviewees stated the intention to eventually marry. Notably, these two interviewees were both men in contingent jobs. Consistent with the findings of quantitative research (Piotrowski, Kalleberg, and Rindfuss 2015), each of them voiced anxiety over whether they would be able to fulfill the responsibility of supporting a family.

8.1 Female interviewees' partner preferences

The majority of female interviewees stated their wish to marry a man with a stable job, meaning that he is a regular full-time employee (i.e., with an indefinite contract and therefore not subject to layoffs except in extreme economic circumstances). Typical examples of women's expressions for this preference were "I prefer him to have a stable job as a full-time worker"; "He has to be a regular worker"; "It is not acceptable if he is a non-regular worker because it would cause financial instability."

Some women articulated not only the gendered role they desire for a marriage partner but also the role they anticipate for themselves, as reflected in this comment: "Definitely a regular worker. I want to do the housework, so he needs to earn for the family. As for myself, I can consider working as a part-time or non-regular worker [i.e., a contract worker]." This raises the issue of how single women imagine their own work lives after marriage. The majority of female interviewees stated a desire to leave full-time work when they married, either cutting back to a part-time job or temporarily leaving the labor force until children are older. Almost none of the female interviewees stated a desire to become a permanent housewife. Instead, it was common for women to make statements such as "My character is not suitable for staying home all the time, and I want to earn money" or "I don't intend to be a housewife as I want to contribute to society and have contact with people."

When women referenced a future husband's education, it was almost always in the context of what he would be doing for a living. This is illustrated well by one interviewee's very specific description of where she hoped her potential partner would be working versus her more neutral description of his education: "I prefer a regular employee in a company listed in the first section of the Tokyo Stock Exchange. Such companies are stable and mainly hire college graduates."

8.2 Male interviewees' partner preferences

Men's image of an ideal wife was quite consistent with women's image of their future married life. Many men stated a preference for their potential spouse to bring some income into the household (reflected, for example, in statements such as "for economic reasons, she might have to work part-time"). Nevertheless, the implicit assumption was that the husband would be the *daikokubashira* (the breadwinner, or literally "the pillar of the household"). The issue of a potential spouse's education almost never arose in the male interviews.

8.3 Summary of partner preferences

In sum, the interview data portray a picture of single women's preferences that is highly consistent with the marriage agency data: women place a high priority on a future husband's earning power and less emphasis on his education. Most women express a desire to earn money for the household after they marry, with the majority indicating that they plan to switch to part-time work or temporarily leave the labor force during the most intensive period of childrearing. Most men mirrored the expectation that their wife would work, although generally not in a full-time job. While this supports Oppenheimer's prediction that women's potential earning power matters to men, Becker's theoretical framework emphasizing gender-role specialization is also appropriate. Although many male interviewees expressed the hope that their wives would work, wives' potential earnings were universally envisioned by men as supplementary income to the household. This is consistent with our descriptive findings from the quantitative analysis, indicating that men appear to value women's income but their preference is not linear. In fact, our data on the number of dating offers received by women follow an inverted U-shaped pattern, with the highest-earning women actually receiving the lowest number of offers.

Interestingly, findings from our qualitative data closely mirror results from the 2015 National Fertility Survey (NFS; National Institute of Population and Social Security Research 2015). In that survey, single Japanese men and women age 18 to 34 were asked to prioritize their preferences for various characteristics of a potential spouse. Academic background (education) was not a strong priority for either men or women, although the survey indicated that women prioritized education to a slightly higher degree than men did. Similarly, a potential mate's economic resources were not a strong priority for men but were much more so for women.

The NFS asked single Japanese women to choose their ideal and intended life course. For single women, the ideal in 2015 was returning to work after children are older (chosen by 34.6% of women), closely followed by the pattern of managing both work and family,

that is, working continuously (32.3% of women). The ideal of being a full-time housewife dramatically declined after the early 1990s, when it had been the most popular choice. By 2015, only 18.2% of women chose this as their ideal. In short, the popularity of the return-to-work pattern and the pattern of continuous employment were the top two intended life course trajectories chosen by women.

In the NFS, single men were also asked to choose the lifestyle they expected a potential marriage partner to follow. Men's expectations for women closely mirrored women's own intended life course trajectories. Notably, the proportion of men who reported the expectation that their wife would be a full-time housewife was higher than women's own expectation at the end of the 1980s and then fell even more dramatically and to a lower level (just 10.1%) by 2015 than women's expectation to be a housewife. This suggests men's increased propensity to value a women's earning potential and her desire not to permanently leave the labor force upon getting married.

9. Conclusion

Japan in the 21st century is characterized by late age at marriage, increasing rates of singlehood, and very low fertility, even though Japanese surveys continue to find that the vast majority of young people intend to marry during their lifetime. We know little about the search process and how single men's and women's prioritization of various attributes of a potential spouse are manifested and change as a result of dating experiences.

This paper utilized two unique data sources on the partner preferences of single Japanese. The first is composed of records from one of Japan's largest marriage agencies on single men's and women's partner search preferences and behaviors during a two-year period of interactions (January 2006–December 2007). Individuals in the sample are somewhat more highly educated and have higher incomes than the national population of Japanese singles. Fortuitously, these features of the data allowed us to focus particularly on a highly relevant period of time (post-2005) when marital sorting among highly educated Japanese men and women was moving toward a pattern of female hypogamy (Fukuda, Raymo, and Yoda 2019). We supplemented marriage agency data with in-depth interviews conducted with 30 urban, native-born, highly educated Japanese singles in their late 20s and 30s in 2012.

Our quantitative data allowed us to look at individuals' preferences for a potential partner's income, education, and age as well as their preferences for a partner's characteristics relative to their own. Irrespective of the relative comparison with themselves, both men and women value education and income in a prospective partner. But the appeal of women with high education and income stretches only so far, as men's dating behavior indicates that they shy away from women who have a graduate education

or earn a high income. Instead, they prefer women who can make some – but not necessarily a large – potential financial contribution to the household. It is worth noting that while men tend not to send offers to women who have a graduate education and earn a high income, they actually accept offers from these high-profile women more often than they accept offers from low-profile women. As noted earlier, this may reflect the sharp increase over the past few decades in single men's tendency to prefer a potential marriage partner who plans to continue working after having children rather than becoming a full-time wife and mother (National Institute of Population and Social Security Research 2015). Women's preferences for men's absolute levels of education and income, on the other hand, demonstrate a strong linear pattern: the more the better.

We analyzed men's and women's preferences for key characteristics of a potential mate relative to themselves by using a fixed-effects logit analysis of the probability of accepting a dating offer from bidders with various characteristics. After controlling for preferences for the absolute age, education, income, and other key characteristics of bidders, we examined the effect of a bidder's characteristics relative to the target (who accepts or rejects the bid) on the target's probability of accepting an offer. We also examined whether and how the extent of a target's experience with the dating agency affected the weight of relative preferences in the decision to accept a dating offer.

Women express a preference for a partner who does not have less education than theirs, but this preference slightly diminishes over time. In contrast, their preference for a high-earning partner – and their reluctance to date men who earn less than they themselves do – does not adjust over the time period of our observations. When women do adjust their preferences, they appear to do so slowly. Extrapolating from our data, it would require seven and a half years for women to become willing to accept a partner with less education than their own, and three and a half years before women's preference for older men is significantly weakened. Preference adjustment may be particularly common among women who are keen to marry. However, it is striking that even among individuals motivated enough to join a marriage agency, preference adjustment happens rather slowly.

Men accept many more dating offers than women and exhibit little adjustment in their preferences over time. In contrast to women, men do not demonstrate strong preferences for the relative education and income of their prospective partner, and we find little indication that their preferences change during the period of our observation. The only exception is that their preference not to accept dating offers from women older than themselves becomes slightly more pronounced over time. But overall, rather than aiming to find their ideal partner even at the outset, men's strategy might be better characterized as trying to find a partner who is 'good enough.' This approach seems to make them fairly time-insensitive in terms of which date offers they respond to. Men's preference for a partner who demonstrates some earning capacity is consistent with

Oppenheimer's prediction that as the transition to adulthood lengthens and age at marriage increases, the valuation of the gender of a potential spouses' earning power becomes more symmetrical.

Our own interview data as well as the results of a national survey reinforce our finding from the quantitative analysis that women's preference for a mate more highly educated than themselves is not necessarily a key determinant of making a match. This is consistent with recent quantitative research documenting movement away from educational hypergamy and toward educational hypogamy among highly educated Japanese women (Fukuda, Raymo, and Yoda 2019). At the same time, our quantitative and qualitative data indicate women's continued strong desire to marry a man who earns more than they do. This reflects the enduring norms of gender-role specialization in Japanese marriage and is thus consistent with Becker's specialization model.

Our analysis suggests how the partner search process may be influencing intracohort marriage formation patterns, thus complementing research that has analyzed the influence of cohort replacement on marital sorting over the past few decades in Japan (e.g., Fukuda, Yoda, and Mogi 2019). A limitation of our study is that our quantitative analysis focuses on understanding how women's and men's preferences affect their response to dating offers but does not extend to a consideration of how their preferences as bidders may change over time. In the marriage market, individuals participate simultaneously as bidders and targets. Hence, their partner preferences cannot be fully understood without an investigation into their experience on both sides – approaching potential mates as well as being approached. A fruitful area for future research will be the examination of how changes in women's and men's preferences as bidders is related to their past experience as targets and vice versa.

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References

Becker, G.S. (1973). A theory of marriage, part I. *Journal of Political Economy* 81(4): 813–846. doi:10.1086/260084.

Becker, G.S. (1985). Human capital, effort, and the sexual division of labor. *Journal of Labor Economics* 3(1): Part 2: S33–S58. doi:10.1086/298075.

Becker, G.S. (1993). *A treatise on the family*. Cambridge: Harvard University Press.

Bergstrom, M. (2018). What's behind the age gap between spouses? Big data and the study of age difference within couples. *Revue Francaise de Sociologie* 59(3): 395–422. doi:10.3917/rfs.593.0395.

Blossfeld, H.-P. (2009). Educational assortative marriage in comparative perspective. *Annual Review of Sociology* 35: 513–530. doi:10.1146/annurev-soc-070308-115 913.

Boxer, C.F., Noonan, M.C., and Whelan, C.B. (2015). Measuring mate preferences: A replication and extension. *Journal of Family Issues* 36(2): 163–187. doi:10.1177/ 0192513X13490404.

Breen, R. and Salazar, L. (2011). Educational assortative mating and earnings inequality in the United States. *American Journal of Sociology* 117(3): 808–843. doi:10.1086/661778.

Brinton, M.C. (2001). *Women's working lives in East Asia*. Stanford: Stanford University Press.

Brinton, M.C. (2011). *Lost in transition: Youth, work, and instability in postindustrial Japan*. Cambridge: Cambridge University Press. doi:10.1017/CBO97805117 62741.

Brinton, M.C. and Oh, E. (2019). Babies, work, or both? Highly educated women's employment and fertility in East Asia. *American Journal of Sociology* 125(1): 105–140. doi:10.1086/704369.

Bumpass, L.L. and Sweet, J.A. (1972). Differentials in marital instability: 1970. *American Sociological Review* 37(6): 754–766. doi:10.2307/2093585.

Bursztyn, L., Fujiwara, T., and Pallais, A. (2017). 'Acting wife': Marriage market incentives and labor market investments. *American Economic Review* 107(11): 3288–3319. doi:10.1257/aer.20170029.

Buss, D.M. (1989). Sex differences in human mate preferences: Evolutionary hypotheses tested in 37 cultures. *Behavioral and Brain Sciences* 12: 1–49. doi:10.1017/S0140525X00023992.

Buss, D.M. (1998). Sexual strategies theory: Historical origins and current status. *Journal of Sex Research* 35(1): 19–31. doi:10.1080/00224499809551914.

Buss, D.M., Shackelford, T.K., Kirkpatrick, L.A., and Larsen, R.J. (2001). A half century of mate preferences: The cultural evolution of values. *Journal of Marriage and Family* 63(2): 491–503. doi:10.1111/j.1741-3737.2001.00491.x.

Ciscato, E. and Weber, S. (2020). The role of evolving marital preferences in growing income inequality. *Journal of Population Economics* 33(1): 307–347. doi:10.1007/s00148-019-00739-4.

Dernberger, B.N. and Pepin, J.R. (2020). Gender flexibility, but not equality: Young adults' division of labor preferences. *Sociological Science* 7: 36–56. doi:10.15195/v7.a2.

Dunn, M.J., Brinton, S., and Clark, L. (2010). Universal sex differences in online advertisers age preferences: Comparing data from 14 cultures and 2 religious groups. *Evolution and Human Behavior* 31(6): 383–393. doi:10.1016/j.evolhumbehav.2010.05.001.

Edwards, R.D. and Roff, J. (2016). What mom and dad's match means for junior: Marital sorting and child outcomes. *Labour Economics* 40: 43–56. doi:10.1016/j.labeco.2016.04.005.

Eika, L., Mogstad, M., and Zafar, B. (2019). Educational assortative mating and household income inequality. *Journal of Political Economy* 127(6): 2795–2835. doi:10.1086/702018.

Esteve, A., Schwartz, C.R., Van Bavel, J., Permanyer, I., Klesment, M., and García-Román, J. (2016). The end of hypergamy: Global trends and implications. *Population and Development Review* 42(4): 615–625. doi:10.1111/padr.12012.

Eurostat (2015). Demography report – 2015 edition. [electronic resource]. European Commission. https://ec.europa.eu/eurostat/web/ess/-/demography-report-2015-edition.

Feliciano, C., Robnett, B., and Komaie, G. (2009). Gendered racial exclusion among white internet daters. *Social Science Research* 38(1): 39–54. doi:10.1016/j.ssresearch.2008.09.004.

Fernandez, R., Guner, J., and Knowles, J. (2005). Love and money: A theoretical and empirical analysis of household sorting and inequality. *Quarterly Journal of Economics* 120(Feb): 273–344. doi:10.1162/0033553053327498.

Fisman, R., Iyengar, S.S., Kamenica, E., and Simonson, I. (2006). Gender differences in mate selection: Evidence from a speed dating experiment. *Quarterly Journal of Economics* 121: 673–697. doi:10.1162/qjec.2006.121.2.673.

Fukuda, S. (2013). The changing role of women's earnings in marriage formation in Japan. *Annals of the American Academy of Political and Social Science* 646: 107–128. doi:10.1177/0002716212464472.

Fukuda, S., Raymo, J.M., and Yoda, S. (2019). Revisiting the educational gradient in marriage in Japan. *Journal of Marriage and Family* 82(4): 1378–1396. doi:10.1111/jomf.12648.

Fukuda, S., Yoda, S., and Mogi, R. (2019). Educational assortative mating in Japan: Evidence from the 1980–2010 census. Tokyo: National Institute of Population and Social Security Research (NIPPSR Working Paper Series (E) 29).

Fuwa, M. (2004). Macro-level gender inequality and the division of household labor in 22 countries. *American Sociological Review* 69(6): 751–767. doi:10.1177/000312240406900601.

Gelman, A. and Hill, J. (2007). *Data analysis using regression and multilevel/ hierarchical models.* New York: Cambridge University Press. doi:10.1017/CBO9780511790942.

Genda, Y. (2001). *Shigoto no naka no aimai na fuan (A vague sense of job insecurity).* Tokyo: Chūō Kōron Shinsha.

Hertog, E. (2020). Attitudes to marriage and childbearing. In: Coates, J., Fraser, L., and Pendleton, M. (eds.). *The Routledge companion to gender and Japanese culture*. London: Routledge: 92–105. doi:10.4324/9781315179582-10.

Hertog, E. and Kan, M.Y. (2019). *Education and gendered division of domestic labor over time in contemporary Japan.* Paper presented at the Population Association of America Annual Meeting, Austin, Texas, April 10–13, 2019.

Hitsch, G.J., Hortaçsu, A., and Ariely, D. (2010). What makes you click? Mate preferences and matching outcomes in online dating. *Quantitative Marketing and Economics* 8(4): 393–427. doi:10.1007/s11129-010-9088-6.

Hook, J.L. (2006). Care in context: Men's unpaid work in 20 countries, 1965–2003. *American Sociological Review* 71(4): 639–660. doi:10.1177/00031224060710 0406.

Kalmijn, M. (1998). Intermarriage and homogamy: Causes, patterns, trends. *Annual Review of Sociology* 24(1): 395–421. doi:10.1146/annurev.soc.24.1.395.

Kan, M.Y. and Hertog, E. (2017). Domestic division of labour and fertility preference in China, Japan, South Korea, and Taiwan. *Demographic Research* 36(18): 557–588. doi:10.4054/DemRes.2017.36.18.

Killewald, A. (2016). Money, work, and marital stability: Assessing change in the gendered determinants of divorce. *American Sociological Review* 81(4): 696–719. doi:10.1177/0003122416655340.

Kippen, R., Chapman, B., Yu, P., and Lounkaew, K. (2013). What's love got to do with it? Homogamy and dyadic approaches to understanding marital instability. *Journal of Population Research* 30(3): 213–247. doi:10.1007/s12546-013-9108-y.

Lee, S. (2008). Preferences and choice constraints in marital sorting: Evidence from Korea. Stanford: Stanford Institute for Economic Policy Research (SIEPR working paper 07-042).

Lenton, A.P., Fasolo, B., and Todd, P.M. (2010). Who is in your shopping cart? Expected and experienced effects of choice abundance in the online dating context. In: Knock, N. (ed.). *Evolutionary psychology and information systems research: A new approach to studying the effects of modern technologies on human behavior.* New York: Springer: 149–167. doi:10.1007/978-1-4419-6139-6_7.

Lin, K.-H. and Lundquist, J.H. (2013). Mate selection in cyberspace: The intersection of race, gender, and education. *American Journal of Sociology* 119(1): 183–215. doi:10.1086/673129.

Mare, R.D. (2016). Educational homogamy in two gilded ages: Evidence from inter-generational social mobility data. *The Annals of the American Academy of Political and Social Science* 663(1): 117–139. doi:10.1177/0002716215596967.

METI (2005). A survey on marriage advice/ marriage information services (Kekkon Sōdan/ kekkon jōhō sābisu ni kansuru chōsa). [electronic resource]. Tokyo: Ministry of Economy, Trade and Industry. www.meti.go.jp/english/.

MEXT (2017). Report of Education related statistics (Monbu kagaku tōkei yōran). [electronic resource]. Tokyo: Ministry of Education, Culture, Sports, Science, and Technology. https://www.mext.go.jp/en/index.htm.

National Institute of Population and Social Security Research (2015). 15th national fertility survey: Marriage process and fertility of married couples, and attitudes toward marriage and family among Japanese singles. Tokyo: Department of Population Dynamics Research. http://www.ipss.go.jp/ps-doukou/e/doukou15/Nfs15_gaiyoEng.html.

Ní Bhrolcháin, M. and Sigle-Rushton, W. (2005). Partner supply in Britain and the US: Estimates and gender contrasts. *Population* 60(1–2): 37–64. doi:10.2307/4148201.

Ochiai, E. and Molony, B. (2008). *Asia's new mothers: Crafting gender roles and childcare networks in east and southeast Asian societies*. Kent: Global Oriental Limited. doi:10.1163/ej.9781905246373.i-232.

OECD (2020). Time use database. [electronic resource]. Paris: The Organisation for Economic Co-operation and Development. stats.oecd.org/.

Ono, H. (2003). Women's economic standing, marriage timing, and cross-national contexts of gender. *Journal of Marriage and Family* 65(2): 275–286. doi:10.1111/j.1741-3737.2003.00275.x.

Oppenheimer, V.K. (1988). A theory of marriage timing. *The American Journal of Sociology* 94(3): 563–591. doi:10.1086/229030.

Osawa, M., Kim, M.J., and Kingston, J. (2013). Precarious work in Japan. *American Behavioral Scientist* 57(3): 309–334. doi:10.1177/0002764212466240.

Parsons, T. (1951). *The social system*. London: Routledge and Kegan Paul.

Piotrowski, M., Kalleberg, A., and Rindfuss, R.R. (2015). Contingent work rising: Implications for the timing of marriage in Japan. *Journal of Marriage and Family* 77(5): 1039–1056. doi:10.1111/jomf.12224.

Pollet, T.V. and Nettle, D. (2008). Driving a hard bargain: sex ratio and male marriage success in a historical US population. *Biology Letters* 4(1): 31–33. doi:10.1098/rsbl.2007.0543.

Potarca, G. and Mills, M. (2015). Racial preferences in online dating across European countries. *European Sociological Review* 31(3): 326–341. doi:10.1093/esr/jcu093.

Qian, Y. and Sayer, L.C. (2016). Division of labor, gender ideology, and marital satisfaction in East Asia. *Journal of Marriage and Family* 78(2): 383–400. doi:10.1111/jomf.12274.

Raymo, J.M. and Iwasawa, M. (2005). Marriage market mismatches in Japan: An alternative view of the relationship between women's education and marriage. *American Sociological Review* 70(5): 801–822. doi:10.1177/000312240507000 504.

Raymo, J.M., Park, H., Xie, Y., and Yeung, W.J.J. (2015). Marriage and family in East Asia: Continuity and change. *Annual Review of Sociology* 41(1): 471–492. doi:10.1146/annurev-soc-073014-112428.

Raymo, J.M. and Shibata, A. (2017). Unemployment, nonstandard employment, and fertility: Insights from Japan's 'Lost 20 years'. *Demography* 54(6): 2301–2329. doi:10.1007/s13524-017-0614-y.

Retherford, R.D., Ogawa, N., and Matsukura, R. (2001). Late marriage and less marriage in Japan. *Population and Development Review* 27(1): 65–102. doi:10.1111/j. 1728-4457.2001.00065.x.

Schmitz, A., Skopek, J., and Blossfeld, H.-P. (2011). The gendered dynamics of age preferences – Empirical evidence from online dating. *Zeitschrift für Familienforschung* 23(3): 267–290.

Schmitz, A., Zillmann, D., and Blossfeld, H.-P. (2013). Do women pick up lies before men? The association between gender, deception patterns, and detection modes in online dating. *Online Journal of Communication and Media Technologies* 3(3): 52–73. doi:10.29333/ojcmt/2434.

Schwartz, C.R. (2010). Earnings inequality and the changing association between spouses' earnings. *American Journal of Sociology* 115(5): 1524–1557. doi:10.1086/651373.

Schwartz, C.R. (2013). Trends and variation in assortative mating: Causes and consequences. In: Cook, K.S. and Massey, D.S. (eds.). *Annual Review of Sociology* Vol 39. Palo Alto: Annual Reviews: 451–470. doi:10.1146/annurev-soc-071312-145544.

Skopek, J., Schmitz, A., and Blossfeld, H.-P. (2011). The gendered dynamics of age preferences: Empirical evidence from online dating. *Zeitschrift für Familienforschung* 27(2): 267–290.

South, S.J. (1991). Sociodemographic differentials in mate selection preferences. *Journal of Marriage and the Family* 53(4): 928–940. doi:10.2307/352998.

Sweeney, M.M. (2002). Two decades of family change: The shifting economic foundations of marriage. *American Sociological Review* 67(1): 132–147. doi:10.2307/3088937.

Sweeney, M.M. and Cancian, M. (2004). The changing importance of white women's economic prospects for assortative mating. *Journal of Marriage and Family* 66(4): 1015–1028. doi:10.1111/j.0022-2445.2004.00073.x.

Todd, P.M., Billari, F.C., and Simão, J. (2005). Aggregate age-at-marriage patterns from individual mate search. *Demography* 42(3): 559–574. doi:10.1353/dem.2005.0027.

Todd, P.M. and Miller, G. (1999). From pride and prejudice to persuasion: Realistic heuristics for mate search. In: Gigerenzer, G., Todd, P.M., and ABC Research Group (eds.). *Simple heuristics that make us smart*. New York: Oxford University Press: 287–308.

Tsuya, N. (2006). Patterns and covariates of partnership formation in Japan. *Journal of Population Problems* 62(1–2): 1–19.

Tsuya, N., Bumpass, L., Choe, M.K., and Rindfuss, R.R. (2012). Employment and household tasks of Japanese couples, 1994–2009. *Demographic Research* 27(24): 705–718. doi:10.4054/DemRes.2012.27.24.

Tsuya, N., Bumpass, L., and Choe, M. (2000). Gender, employment, and housework in Japan, South Korea, and the United States. *Review of Population and Social Policy* 9: 195–220.

United Nations (2017). World Marriage Data 2017 [electronic resource]. New York: United Nations Department of Economic and Social Affairs, Population Division. www.un.org/en/development/desa/population/theme/marriage-unions/WMD2017.asp.

Yu, W.-H. and Hertog, E. (2018). Family characteristics and mate selection: Evidence from computer-assisted dating in Japan. *Journal of Marriage and Family* 80(3): 589–606. doi:10.1111/jomf.12473.

Appendix 1: Quantitative sample representativeness

As noted in the text, we compared the characteristics of the marriage agency sample with a survey of Japanese singles conducted in 2005 by the Japanese Ministry of Economy, Trade, and Industry (METI). Table A-1 shows that marriage agency customers are generally better educated, have higher incomes, and are slightly older than the population of singles in the national METI survey. The income difference is particularly large for men, given that men with no income or unstable income are ineligible to join the marriage agency. The overrepresentation of better educated and higher-income men and women is common among daters relying on computer matching technology (Hitsch, Hortaçsu, and Ariely 2010; Lin and Lundquist 2013). Internet daters also tend to differ in age from the general population, but the direction of this difference varies in different studies (Lin and Lundquist 2013; Potarca and Mills 2015). Feliciano, Robnett, and Komaie (2009) find internet daters to be older than the general population. Our sample is consistent with this, but this is no doubt due in part to the METI survey's imposition of a cutoff point of age 44 compared to our cutoff point of age 50.

Table A-1: **Sociodemographic characteristics of marriage agency members versus singles population (2005 METI survey)**

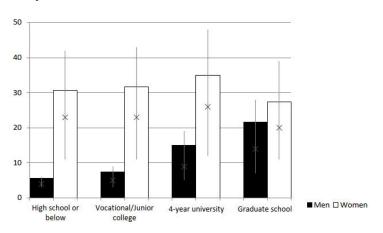|	Women		Men	
	Agency members (%)	METI survey (%)	Agency members (%)	METI survey (%)
Completed education				
High school or below	22.1	27.4	13.2	28.7
Vocational school/ junior college	45.2	40.1	11.8	15.7
University	36.2	28.9	60.3	46.2
Graduate school	2.5	3	14.7	8.4
Other	---	0.6	---	1.0
Annual income (in million yen)[a]				
0–0.99	8.0	25.9	0.01	19.8
1–2.99	35.5	44	0.4	26.7
3–3.99	29.3	16.8	7.0	19.9
4–5.99	23.5	10.1	48.7	23.3
6–7.99	3.1	2.4	29.5	7.4
8.0+	0.6	0.8	14.4	2.9
Mean income	3.0	2.3	6.0	3.3
Age				
20–24	3.2	16.5	0.51	15.2
25–29	21.2	23.2	11.6	22.3
30–34	40.7	22.6	35.3	22.5
35–39	27.8	22.7	32.3	22.8
40–44	6.5	14.9	15.1	17.1
45–50	0.6		5.2	
Mean age	32.7	31.6	35.3	32.1
N	9,832	2,020	7,825	2,020

[a]One million yen was equivalent to approximately $8,500 at the time of data collection.

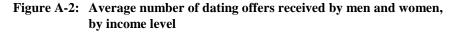## Appendix 2: Dating offers made and accepted, by education and income

For descriptive purposes, we calculated descriptive statistics on the number of offers received and accepted by men and women at different education and income levels. These illustrate the absolute characteristics men and women value in a dating partner.
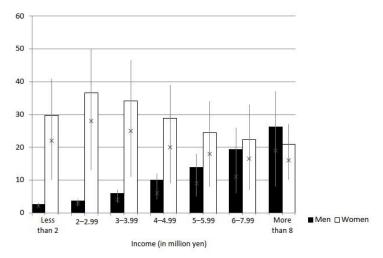
Figures A-1 and A-2 show the number of offers received by men and women at different education and income levels. For men, educational attainment and income operate in much the same fashion: the more education and income they have, the more dating offers they receive. This pattern is consistent with research demonstrating hypergamy in the Japanese marriage market up to the latter part of the decade ending in 2010 (Fukuda, Raymo, and Yoda 2019). The appeal of women's educational attainment and income for potential male dating partners is more nuanced. Women's attractiveness as dating partners is similar whether they are high school or vocational school/junior college graduates. University-educated women receive the highest number of dating offers. But a graduate degree appears to disadvantage a woman in the marriage market to a greater extent than if she has a high school education or less. These descriptive results suggest that while university education for a woman is valued in the Japanese marriage market, graduate education may be 'too much' education. This is not the case for men.

Figure A-1: Average number of dating offers received by men and women, by educational attainment

Note: Gray line indicates a range from the 25th to 75th percentiles; median is marked by "x."

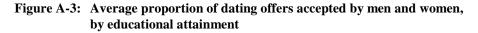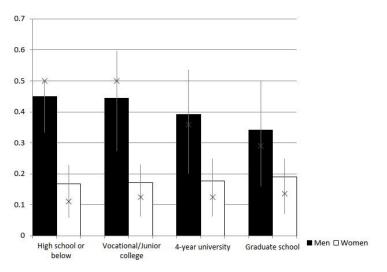**Figure A-2: Average number of dating offers received by men and women, by income level**

Note: Gray line indicates a range from the 25th to 75th percentiles; median is marked by "x."

Gender differences are even more dramatic when it comes to income. Having some earning power appears to advantage women as dating partners: those earning an annual income between ¥2 million to ¥3 million (about $17,000 to $25,500 in 2007 dollars) receive the most dating offers. This generally corresponds to the earnings of a female employee in an entry-level white-collar job at the time of our data collection (2006–2007). Women earning less or more than this appear to be at a disadvantage. Conversely, the number of offers received by women declines monotonically once they earn ¥2 million (about $17,000). Women earning ¥4 million ($34,000) or more receive fewer dating offers than the lowest-earning women. The smallest number of dating offers across all earnings categories is for women who earn the highest incomes (more than ¥8 million, or about $68,000 annually). Thus, men appear to prefer partners able to share some of the financial responsibility but seem to avoid women who earn 'too much,' just as they apparently avoid women who have too much education. In contrast, men's attractiveness as potential dating partners increases monotonically with income, suggesting that women's preference for partner's income is consistent with a specialization model.

Figures A-3 and A-4 complement these gendered patterns by showing the average proportion of dating offers accepted by men and women at various education and income levels. In the descriptive analysis of the number of date offers received and accepted (Table 1 in the text), we noted that men are more active than women, possibly indicating

that they are less 'picky.' Indeed, across education and income levels, men's rate of accepting dating offers is much higher than women's. However, men's acceptance rate declines as their own education and income increase. Highly educated men's acceptance rate (Figure A-3) is consistent with the fact that they receive many more dating offers than other men and can therefore afford to be the most selective. Likewise, the proportion of date offers men accept is negatively related to their income, with the highest-income men accepting fewer than 30% of all date offers compared to closer to 50% for the lowest-income men (Figure A-4). The negative association between men's acceptance rate and their socioeconomic status might indicate that such men receive multiple dating offers at the same time and need to decide on the few they will respond to. It could also be that these high-status men pause in their search after accepting a certain number of offers. The lower acceptance rate of men with high socioeconomic status may thus indicate their greater 'pickiness,' their greater propensity to pause during the search process due to the volume of dating offers they receive, or a combination of both reasons. Our data do not readily allow us to distinguish between these scenarios.

Figure A-3:   Average proportion of dating offers accepted by men and women, by educational attainment

Note: Gray line indicates a range from the 25th to 75th percentiles; median is marked by "x."

Figure A-4:   **Average proportion of dating offers accepted by men and women, by income**

Note: Gray line indicates a range from the 25th to 75th percentiles; median is marked by "x."

Overall, women accept a much lower proportion of date offers than men, and their acceptance pattern by own education and income varies much less than men's. As shown in Figure A-3, women with graduate school education accept a slightly higher percentage of date offers than women at other education levels. This is consistent with their seeming 'unpopularity' in the dating market. Variation in the proportion of dating offers accepted by women at different income levels is minimal.

Appendix 3: Results of robustness checks

The results of the robustness checks we conducted are substantively similar to the findings reported in Table 2 of the paper (and are available online). An important difference, however, is in the interaction between duration and the relative characteristics of bidders and targets. Once we limit the sample to customers who joined the agency at some point after the observation period started, we do not find that women adjust their preferences over time. In other words, women in this subsample do not broaden their search during a period shorter than the two years covered by our data. This suggests that the tendency we found for women to adjust their preferences is time-sensitive and becomes most pronounced once they have been searching for at least two years. This is discussed more fully in the paper's Conclusion.