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Revisiting Marriage Market Mismatch: A Conjoint Survey Experiment Approach

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Abstract (148 words)

The delay and decline in union formation are of particular importance for understanding low fertility in societies characterized by a strong link between marriage and childbearing. While the so-called *marriage market mismatch* provides one compelling explanation for later and less marriage, there is a lack of consensus on how to measure partner preferences; moreover, studies that have relied on observational data suffer from a range of potential biases. To circumvent these limitations, we employ a conjoint survey experiment approach to examine how gender asymmetry in partner preferences may play a role in spouse selection by focusing on socioeconomic status in Japan. While our results confirm gender-specific partner preferences, we do not find strong evidence supporting heterogeneous preferences, which is a core assumption of the marriage market mismatch hypothesis. We also find that educational attainment plays a relatively limited role in partner preferences compared with other socioeconomic status measures.

Keywords: marriage; mate selection; partner preferences; survey experiment

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Introduction

Demographers have long sought to understand the sources of variation in low fertility across rich countries. Particular attention has been given to the group of countries characterized by the "lowest-low fertility," which is defined as total fertility rates that are far below the replacement level. This group includes countries in East Asia, Eastern Europe, and Southern Europe. Among the multiple explanations for declining fertility (e.g., Mason 1997; Han and Brinton 2022), the so-called *marriage market mismatch* offers one compelling explanation for fertility decline in East Asia, where later and less marriage are identified as the primary drivers of fertility decline (Atoh et al. 2004; Jones 2007; Retherford et al. 2001; Retherford and Ogawa 2006; Tsuya and Mason 1995).

According to the marriage market mismatch framework, there are two mechanisms underlying the trend toward later and less marriage, namely, stable partner preferences and a changing opportunity structure. The former refers to sets of characteristics that individuals consider for a potential spouse, whereas the latter refers to geographic or organizational constraints often represented by differences in composition in terms of sociodemographic characteristics (Kalmijn 1998; Lichter and Qian 2019). The previous literature on marriage market mismatch has mostly quantified the contribution of the latter mechanism. Moreover, these studies have implicitly assumed the presence of the former mechanism rather than empirically testing for it. Specifically, this lack of testing is partially due to (1) the absence of agreement regarding how to measure partner preferences, (2) the absence of data that directly measure preferences, and (3) the multidimensional nature of partner preferences. However, a more fundamentally important omission in the literature, we believe, is a proper research design

that allows us to estimate the causal effects of the multiple potential partner characteristics that are reflected in the preferences of individuals who are evaluating potential partners.

In this paper, we therefore seek to overcome the limitations of previous studies by using a conjoint survey experimental approach to eliminate a range of potential biases and test important theoretical assumptions about the role of partner preferences in shaping assortative mating and marriage market mismatches. To address this question, we consider the case of Japan, where later and less marriage is a primary behavioral mechanism for low fertility. The main indicator of socioeconomic status that we consider in this study is educational attainment, given that this concept has been extensively examined in previous studies on marriage market mismatch and associated outcomes such as marriage timing or assortative mating in Japan (Fujihara and Uchikoshi 2019; Piotrowski et al. 2015; Raymo and Iwasawa 2005; Raymo et al. 2021). We also differentiate college education by selectivity in light of recent evidence that the college-educated population has diversified in response to rapid college expansion and that their union formation patterns differ by college quality (Uchikoshi 2022). We compare these results with those obtained by examining income and work arrangements. By doing so, our results provide important insights into the multidimensional nature of partner preferences in the marriage market.

By estimating the causal effects of potential partner characteristics, this study contributes to both the theoretical and the methodological literature on mate selection. First, this study contributes theoretically by explicitly quantifying partner preferences. This allows us to test multiple important theoretical assumptions about spouse selection, whereas existing studies have implicitly assumed the presence of partner preference in shaping spouse pairing patterns. Second, methodologically, this study focuses on mechanisms of spouse selection. Previous studies have

not developed a rigorous approach with which to measure partner preferences, as they have often relied on observational data, which suffer from a range of potential biases, as we discuss later. In contrast to these studies, our study provides causal estimates that allow us to identify the presence of partner preferences and test hypotheses on mate selection.

Background

The role of marriage market mismatch in fertility decline

Previous studies have argued that the delay and decline in partnership formation is particularly salient for fertility decline in societies characterized by a strong relationship between marriage and childbearing, including countries located in East Asia. This is because a strong relationship leads to fewer births outside marriage. If nonmarital childbearing is not a common option, then marital fertility accounts for nearly all completed fertility. Therefore, by contributing to marital fertility, later and less marriage results in a decline in fertility. If fertility recuperation at older ages is limited, then marriage delay contributes to fertility decline. In East Asian societies, the nonmarital childbearing rate has been low, i.e., approximately 2–3% in Japan, South Korea, and Singapore (OECD 2024), 4% in Taiwan (Ministry of the Interior 2023), and 8% in Hong Kong (Gietel-Basten and Verropoulou 2018). These figures are significantly lower than the nonmarital childbirth rates reported in other economically comparable countries, such as the United States (40%) and Nordic countries (over 50%) (OECD 2023).

In such contexts, it is safe to assume that there are only two proximate causes of low fertility, namely, the delay and decline in partnership formation and declining fertility within partnerships. Decomposition analyses have consistently revealed that the former is particularly important for explaining declining fertility in most East Asian countries (Atoh et al. 2004; Jones

4

2007; Retherford et al. 2001; Retherford and Ogawa 2006; Tan et al. 2024; Tsuya and Mason 1995). More specifically, Atoh et al. (2004) estimated that changes in marriage rates account for approximately 70% of the changes in the period TFR in Japan from 1975 to 2000. The contribution of marriage rates to the declining TFR is approximately 40–50% for other East Asian societies (South Korea, Singapore, and Hong Kong) during similar periods.

Recognizing the salient role of changing marriage dynamics in explaining fertility outcomes in East Asia, including Japan, previous studies have explored sources of declining marriage (Raymo et al. 2015). In this context, so-called *marriage market mismatch* has been discussed as a compelling explanation (Mu and Xie 2014; Raymo and Iwasawa 2005; Raymo and Park 2020). These studies have focused on how changes in structural constraints in the marriage market lead to an excess supply of low-educated men and highly educated women, resulting in mismatch. According to these studies, the contribution of market mismatch is not negligible. For example, an earlier study showed that approximately one-fourth of the decline in marriage rates among college-educated women in Japan is accounted for by such mismatches in the marriage market (Raymo and Iwasawa 2005).

Theoretically, the marriage market mismatch literature is based on the theory of assortative mating. In this theoretical framework, there are two potential forces that shape mate selection, namely, partner preferences and opportunity structure (Blossfeld 2009; Kalmijn 1998; Schwartz 2013). First, the perspective focused on the partner preference component posits that mating preferences influence whom people seek to partner with. These preferences are multidimensional and include physical (e.g., appearance), demographic (e.g., age), and socioeconomic (e.g., income or education) characteristics (Buss and Schmitt 2019). Marriages tend to involve individuals with similar characteristics (assortative mating). Previous research

has also assumed, either explicitly or implicitly, that these characteristics are valued differently in the marriage market by men and women. This gender asymmetry results in both female hypergamy (women marrying up) and female hypogamy (women marrying down); previous studies have suggested that the former is a more preferred and normative type of union formation than the latter, although attitudes toward the latter may be changing (Fukuda et al. 2020; Schwartz and Han 2014). Studies have also suggested that such asymmetry may be particularly relevant in societies characterized by strong preferences for female status hypergamy (Jones et al. 2009), including China (Mu and Xie 2014), Japan (Brinton et al. 2021; Raymo and Iwasawa 2005) and South Korea (Raymo and Park 2020).

Second, the perspective focused on the opportunity structure component posits that the spouse search process is constrained by the local marriage market structure, which varies depending on the distribution of certain individual characteristics in different social settings, such as schools, workplaces, or neighborhoods (Iwasawa and Mita 2007; Kalmijn and Flap 2001). The marriage market structure can affect one's chances of finding a partner. For example, relative improvements in women's educational attainment, which results in a decline in the relative supply of highly educated men, can lead to marriage market mismatches that are detrimental to both less-educated men and highly educated women (Raymo and Iwasawa 2005).

Marriage market mismatch by socioeconomic status in Japan
In Japan, as in other societies, there is a tendency for women to marry someone with a similar socioeconomic status (status homogamy) or someone with a higher (lower) status than their own (female status hypergamy) (Raymo and Iwasawa 2005). From the men's perspective, this indicates that men tend to prefer women whose status is lower than their own and do not prefer

6

women whose status is higher than their own. The results from observational studies provide evidence for spouse pairing patterns based on educational attainment (Fujihara and Uchikoshi 2019; Fukuda et al. 2021; Miwa 2007; Raymo and Xie 2000), earnings (Brinton et al. 2021), and employment status (Taromaru 2011); however, the relative prevalence of status homogamy, at least with respect to educational attainment, has declined in both absolute and relative terms in recent years (Fujihara and Uchikoshi 2019; Fukuda et al. 2021; Miwa 2007; Raymo and Xie 2000). Importantly, we cannot distinguish sources of observed female hypergamy patterns on the female side from those on the male side. More specifically, it is not possible to discuss observed female hypergamy patterns that stem from female or male preferences for female hypergamy or hesitancy for female hypogamy.

Moreover, previous studies have suggested that increasing levels of educational attainment and access to the labor market for women in recent decades, in conjunction with stable preferences for status homogamy or hypergamy, have resulted in a relative decline in the supply of desirable men in the marriage market (Raymo and Iwasawa 2005; Raymo and Park 2020). However, recent studies have shown that women with greater economic potential (as measured by educational attainment or earnings) are more likely to marry (Fukuda 2013; Fukuda et al. 2020). These results suggest a possible decline in preferences for homogamy and female hypergamy and an increased propensity for female status hypogamy (women marrying down in terms of socioeconomic status) (Fukuda et al. 2020).

In evaluating changing socioeconomic gradients in marriage or assortative mating by socioeconomic status, studies have suggested that the results are sensitive to changes in distribution. This is especially likely to be the case for the college-educated population. In Japan and other East Asian countries, access to higher education has expanded rapidly (Hannum et al.

2019). In these societies, educational expansion has been driven by the establishment of new private institutions, most of which are in the lower ranks of the selectivity hierarchy (Feng 2022; Ishida 2007; Jo 2018; Uchikoshi 2022; Yu and Chen 2023). In Japan, the pool of college graduates has become increasingly diverse, especially among women (Uchikoshi et al. 2024). The co-occurrence of educational expansion and differentiation thus suggests that the observed changes in the role of women's educational attainment in marriage formation may simply reflect the tendency of nonselective college graduates to marry partners who did not complete college. Therefore, it is possible that preferences for female educational hypergamy and avoidance of female educational hypogamy still exist within levels of college selectivity. Indeed, anecdotal evidence suggests that women who attended the nation's top university (i.e., the University of Tokyo) are disadvantaged in the marriage market (Rich 2019), whereas observational studies have revealed that there is a tendency for homogamous marriages among educational elites (Uchikoshi 2022).

Reconsidering the conventional approach to marriage market mismatch

As briefly discussed above, the marriage market mismatch literature, or that on assortative mating in general, has focused primarily on the role of structural changes in the marriage market (e.g., women's increasing educational attainment), with relatively limited attention being given to the role of (changing) partner preferences (Lichter and Qian 2019). Importantly, these preferences are assumed to be heterogeneous across demographic groups. In our view, the assumptions about partner preferences remain implicit, partially because of a significant lack of consensus on how to measure preferences. Some studies have estimated the likelihood of specific pairings via group-based estimation as a reflection of preferences (Choi and Mare 2012; Hou and

Myles 2008; Schwartz and Mare 2005); however, estimated parameters from population-level data reflect not only preferences but also opportunities and other structural forces (Schwartz 2013, note 6). While behavioral data from online dating or marriage agencies allow researchers to identify mate selection processes (Brinton et al. 2021; Lin and Lundquist 2013; Yu and Hertog 2018), such studies are constrained by their representativeness (Lichter and Qian 2019). Additionally, while these studies seem to provide estimates of partner preferences, real-world mate selection reflects interactions between two individuals (Logan et al. 2008). Therefore, the estimates provided by these studies likely reflect not only preferences but also preference mismatches and interactions with potential mates in the marriage or dating market, which are fundamentally constrained by opportunities. This makes separating individual preferences from the opportunity structure more difficult (Lichter and Qian 2019). Additionally, normally, more than one characteristic is valued in the partner search process. Moreover, these traits are often bundled together (Lichter and Qian 2019). For example, educational attainment is correlated with higher earnings and other socioeconomic resources, which makes it very difficult for us to estimate the causal effects of single traits on partner search processes in observational data. In summary, the absence of a research design that enables the proper capture of the multidimensionality of partner preferences prohibits us from accurately understanding the nature of assortative mating and marriage market mismatches.

To measure preferences, previous studies have relied on responses to questions about spouse selection criteria in nationally representative surveys; however, the results based on such observational data are not necessarily consistent with theoretical expectations. For example, while many studies have assumed a tendency for female status hypergamy, unmarried women, when surveyed, are less likely to select socioeconomic status as a spouse selection criterion

relative to other characteristics, such as personality (National Institute of Population and Social Security Research 2022). This apparent discrepancy may simply reflect social desirability bias in response patterns, thus complicating efforts to draw definitive conclusions from observational data. Therefore, we need to minimize the effect of social desirability bias in measuring preferences.

In this study, we use data from a conjoint survey experiment to provide further evidence regarding assortative mating, with a focus on the educational attainment and selectivity of colleges. The survey experiment approach also allows us to compare how selectivity gradients in partner preferences, if any, are comparable to gradients by other socioeconomic measures, including income and employment status. A conjoint survey experiment is particularly useful because it enables us to address the issues of multidimensionality in preferences and social desirability bias (Horiuchi et al. 2022).

Research question and hypotheses

In this study, we test hypotheses regarding marriage market mismatch by socioeconomic status. In hypothesis testing, we specifically focus on educational attainment since this has been the most widely discussed factor in the assortative mating literature (Blossfeld 2009; Schwartz 2013). We also focus on educational attainment because other measures of respondents' socioeconomic status (e.g., current income or work arrangements) may differ from their status when they are in the marriage market; this is a concern that is especially salient for relatively older people and married women. Therefore, we discuss the results obtained by using other socioeconomic status measures compared with those obtained by focusing on educational attainment.

We specifically test the following three hypotheses. First, we hypothesize that men (women) tend to prefer women (men) whose educational attainment is lower (higher) than their own (preference for female educational hypergamy) (Hypothesis 1). Second, we also hypothesize that men tend not to prefer women whose status is higher than their own (men's distaste for female educational hypogamy) (Hypothesis 2). This hypothesis focuses on men's preferences because female educational hypogamy has been interpreted as a deviation from the male-breadwinner model and a threat to men's male identity (Brennan et al. 2001; Grow et al. 2017; Liebig et al. 2012). Finally, we hypothesize that the stated association for men's hesitancy toward female educational hypogamy is particularly strong for women at the upper end of the educational spectrum (Hypothesis 3).

Research design: conjoint survey experimental approach

We use a conjoint experiment to measure the effects of specific traits on the attractiveness of hypothetical spousal candidates.[1] In this experiment, respondents are randomly presented with paired candidate profiles and asked to rate their attractiveness on a 7-point scale.[2] Specifically, respondents are asked to answer the following question: "We will show you a brief description of two fictional individuals. Imagine that these two people are close to you. Please rate how attractive they are as a current potential marital partner. If you are currently married or have a

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[1] This study was approved by the institutional review board of Gakushuin University . We preregistered our hypotheses and analysis methods on the Open Science Framework (https://osf.io/yzucq). This paper addresses a part of the preregistered hypotheses; the remaining hypotheses have been deferred to other studies.

[2] Note that this is not a paired conjoint design with forced choice. We chose the nonforced design because studies suggest that estimates based on this method show the highest external validity compared with other methods, including forced-choice design (Hainmueller et al. 2015).

partner, please answer as though you are single and without a partner." We repeat this task eight times for each respondent, which means that each respondent rates a total of 16 profiles.[3]

Although evaluating such profiles is hypothetical and may not represent the real world, a conjoint experiment is considered a compelling method for estimating respondents' multidimensional preferences. Specifically, the conjoint approach helps the experiment meet the information equivalent assumption, which posits that manipulation fixes respondents' beliefs about background characteristics that may affect their beliefs about the quantity of interest (Dafoe et al. 2018). For example, when only candidates' income is manipulated, respondents may infer their educational attainment and other related characteristics from their income information (e.g., high-income candidates are presumed to be highly educated). This makes it difficult to isolate the effects of income from those of other factors. By jointly presenting and independently manipulating income and educational attainment, as well as other relevant information, we can disentangle the effects of these concepts and elucidate people's multidimensional preferences. This is one of the important advantages over using observational data, where these factors are often highly interdependent, which prevents us from untangling the bundled effects. Moreover, empirical evidence has suggested that the conjoint design mitigates social desirability bias compared with standard survey questions (Horiuchi et al. 2022). Since multiple factors are manipulated simultaneously, respondents are less likely to be concerned that scholars can identify which specific factor their responses are addressing.

The conjoint experiment is embedded in a preregistered original survey fielded in late March 2023, targeting Japanese men and women aged 25−49 with a heterosexual orientation. We

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[3] There is a concern that asking respondents to complete many conjoint tasks may influence the response quality. However, studies have found that the number of tasks does not influence the response quality, at least up to 30 tasks (Bansak et al. 2018).

distributed the survey questionnaire to online panel respondents registered with Rakuten Insight, Inc., which is a subsidiary company of Rakuten, Inc., one of the largest Japanese online retailing companies. To ensure that the sample distribution is close to that of the Japanese population, respondents are quota sampled on the basis of gender, five-year age groups, and eight major regions. The planned sample size was 3,000; however, after the sample is restricted to cases with valid responses and information on sexual orientation, the final number of respondents is 2,950 (1,474 for men and 1,476 for women). The number of recorded ratings is 23,584 for men (=1,474×16) and 23,616 for women (=1,476×16).[4]

To simulate potential partners for respondents, we manipulate eight characteristics. Three of them are socioeconomic statuses, which are the focus of this paper, namely, educational attainment, work arrangements, and relative income.[5] The main dimension we are interested in is educational attainment. For this purpose, in addition to the well-established educational categories of high school, professional technical college (also called vocational school, typically two-year institutions), and universities without a specific name, we include four specific universities to assess college selectivity. These universities are the University of Tokyo (the nation's top national university), Waseda University (the nation's top private university in Tokyo), a local university within the respondents' prefecture (moderately selective universities), and Nihon University (a nonselective private university in Tokyo).

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[4] We limit our survey targets to those who identify themselves as "man" or "woman" based on the opening question regarding gender. Moreover, we ask about respondents' sexual orientation and limit our analysis to heterosexual respondents. Including these questions, we show the wording of the survey in the original Japanese and translated English in Supplementary Material A.

[5] The other five traits are age, sibship status, ideal division of domestic labor, the number of past dating partners, and marital status. These traits are included to test other hypotheses, which we do not examine in this specific paper. Similar to the number of tasks, there is a concern that showing conjoint profiles with too many attributes may influence response quality. However, studies have found that respondents provide relatively stable responses, at least up to 35 attributes (Bansak et al. 2021).

Work arrangement and relative income are two other attributes used to measure socioeconomic status, which we compare with the results obtained for educational attainment. The work arrangement categories include regular employees in a large firm, regular employees in a small/medium firm, dispatched or contract workers (nonregular employees), self-employed employees, and public sector employees. The relative income categories range from half of the respondents' own income to three times their income. The survey also collects data on the sociodemographic characteristics of the respondents, including gender, age, marital status, and socioeconomic status. To improve external validity, we do our best to make the distribution of conjoint profiles as close as possible to the distribution in the real world (de la Cuesta et al. 2021). The distributions of the conjoint profiles can be found in Supplementary Material B.

In our initial exploratory analyses, we provide an overview of the results by estimating the marginal means (Leeper et al. 2020) of each attribute level for fictitious marital partners. We then use linear regression to test our hypotheses. We denote y_{ij} as the dependent variable for respondent i's j-th fictitious spouse and x_{ijkl} as a dummy variable indicating attribute k's l-th level of respondent i's j-th fictitious spouse. We also denote α as an intercept, β_{kl} as the coefficient of x_{ijkl} and ε_{ij} as an error term. We estimate parameters via ordinary least squares with standard errors clustered by respondent.

To test Hypothesis 1 and Hypothesis 2, we examine whether respondents tend to prefer fictitious spouses when educational pairing is hypergamy (men's educational attainment > women's educational attainment) and whether male respondents tend to avoid fictitious spouses whose educational attainment is higher than their own (hypogamy, men's educational attainment < women's educational attainment). Here, w_{1ij} is a dummy variable indicating that respondent i's educational attainment is higher than his or her j-th fictitious spouse's educational attainment,

and w_{2ij} is a dummy variable indicating that respondent i's educational attainment is lower than his or her j-th fictitious spouse's educational attainment. We estimate the following linear model separately for female and male respondents:

$$y_{ij} = \alpha + \sum_{kl}\beta_{kl}x_{ijkl} + \lambda_1 w_{1ij} + \lambda_2 w_{2ij} + \varepsilon_{ij} \ ...... \ (1).$$

If λ_2 is positive for female respondents and if λ_1 is positive for male respondents, then this supports Hypothesis 1. If λ_2 is negative for male respondents, then this supports Hypothesis 2.

To test these hypotheses, we group pairings in terms of the respondents' and fictitious spouses' educational attainment into homogamy, female hypergamy, and female hypogamy. This requires ranking their educational attainment. First, we categorize respondents' educational attainment into three groups, namely, noncollege graduates, nonselective college graduates, and selective college graduates.[6] To do this, we ask respondents about their own educational attainment by positioning a two-step question before the conjoint experiment tasks; first, we distinguish between national/public universities and private universities, and then, we ask about ranks within these categories. This process allows us to classify respondents' educational attainment into eight groups.[7] We then consider the pairings of respondents' educational attainment with that of a fictitious spouse.[8]

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[6] Selective colleges consist of selective national universities (i.e., the seven Imperial Universities, namely, the University of Tokyo, Kyoto University, Tohoku University, Kyushu University, Hokkaido University, Nagoya University, Osaka University), selective public universities (e.g., Chiba University and Hiroshima University), and selective private universities (e.g., Waseda University, Keio University, Sophia University, and Tokyo University of Science).

[7] We distinguish these two groups because national and public universities are generally considered more selective and prestigious than private universities (Ishida 1998; Ono 2008).

[8] Specifications are illustrated in Supplementary Material C. "=" means that the respondent's and fictitious spouse's educational attainment is considered equal (homogamy), ">" means that the respondent's educational attainment is considered to be higher than the fictitious spouse's educational attainment. "<" means that the respondent's educational attainment is considered to be lower than the fictitious spouse's educational attainment. Since which pairings are considered hypergamy and hypogamy depends on how we categorize educational attainment (Uchikoshi 2022), we try other specifications for specific pairings (e.g., marriages between selective national and public universities and local national or public universities). As we note in Table A2, results are robust to alternative specifications.

To simplify the analysis for testing Hypothesis 3, we recategorize the education attainment of a fictitious spouse and redefine x_{ij11} as a dummy variable indicating that respondent i's j-th fictitious spouse graduated from the University of Tokyo. We modify Model (1) as follows and estimate this model using data from male respondents:

$$y_{ij} = \alpha + \sum_{kl}\beta_{kl}x_{ijkl} + \lambda_1 w_{1ij} + \lambda_2 w_{2ij} + \kappa x_{ij11}w_{2ij} + \varepsilon_{ij} \text{ ...... (2)}.$$

where λ_2 indicates the average preference for hypogamy when the fictitious spouse did not graduate from the University of Tokyo. $\lambda_2 + \kappa$ indicates the average preference for hypogamy when the fictitious spouse graduated from the University of Tokyo. If κ is negative, then this supports Hypothesis 3.

Results

Descriptive analyses

First, we show the marginal means of each attribute level for hypothetical spouses for exploratory analyses. All the figures below display mean-centered values to make male–female comparisons easier. Here, positive values indicate traits that are perceived more favorably by respondents, whereas negative values indicate traits that are perceived less favorably.

Figure 1 shows ratings for hypothetical spouses' socioeconomic status. We can observe that these potential spouse characteristics are perceived differently by men and women. For example, women are more responsive than men are to potential spouses' income. The gender differences in ratings for relative income are especially pronounced at the upper and lower ends of the income spectrum. With respect to work arrangements, women are more responsive to characteristics that signal employment stability and earnings potential, such as public sector employment and regular employment in a large firm. It is also the case that women tend to rate a

16

potential spouse with precarious employment status (dispatch or contract worker) less favorably.

These results are consistent with previous literature demonstrating gender-asymmetric partner

preferences (e.g., Brinton et al. 2021). Moreover, we do not observe clear gender differences in

the evaluation of spouses' educational attainment. Compared with the other two socioeconomic

status characteristics, the range of the marginal means is relatively small for educational

attainment. This outcome is surprising, given that previous studies have long considered

educational attainment to be one of the most critical dimensions of mate selection (Blossfeld

2009; Schwartz and Mare 2005). This finding may reflect the fact that our experiment

simultaneously includes income and work arrangements, which are two characteristics that are

critical for future economic well-being but are presumably harder to observe than educational

attainment in the marriage market. Because these characteristics are observed in this

experimental context, respondents may place less importance on potential spouses' educational

attainment as a proxy for future earnings potential.

Next, we investigate whether men's and women's ratings differ on the basis of their

socioeconomic status to evaluate the hypothesis about preference for or hesitancy to specific

pairing patterns. Here, we focus on educational attainment. Figure 2 presents the ratings for

potential spouses' educational attainment estimated separately by respondents' gender and

educational attainment. We can see differences in ratings for selective college graduates and

others, suggesting that making distinctions with respect to college selectivity is more appropriate

than simply using educational levels (e.g., college or not) to examine educational assortative

mating in contexts where college expansion has been driven by the growth of less selective

institutions. For example, male selective college graduates show a weaker preference for

noncollege graduates (high school and technical college) and relatively less selective college

17

graduates (Nihon University), whereas they show a stronger preference for University of Tokyo graduates. These results are not consistent with our expectation (Hypotheses 1, 2, and 3) that men tend to prefer women whose socioeconomic status is lower than theirs, especially women at the upper end of the educational spectrum. Rather, this result is more consistent with the literature on the shifting economic foundation of marriage, which posits that both men and women prefer those who are either equally educated or more educated than themselves (Fukuda 2013; Fukuda et al. 2020).

In terms of the female-based results, we also observe patterns that are inconsistent with Hypothesis 1. Similar to men, female selective college graduates tend to rate men without a college education unfavorably, which aligns with our expectations about female status hypergamy; however, they also seem to rate male selective college graduates (University of Tokyo and local national public universities) unfavorably.

Regression results

In subsequent analyses, we estimate regression models controlling for other experimental traits. Tables 1 and 2 present the results estimated separately for men and women. Column 1 includes the potential partner's characteristics, e.g., educational attainment, whereas Column 2 incorporates an interaction between these two variables, which corresponds to the model described in Equation (1). Column 3, which corresponds to the model described in Equation (2), focuses on the potential partner's educational attainment being at the upper end of the educational spectrum (i.e., the University of Tokyo). We present coefficients for the other two partner SES traits (work arrangement and relative income) for reference. All the models account for the remaining partner attributes (e.g., age), although their coefficient estimates are omitted.

Column 1 shows that women (and, to some extent, men) rate a potential partner's high educational attainment favorably.[9] For example, compared with potential partners who completed high school, those who graduated from a university are rated favorably by women (scores approximately 0.16–0.23 points higher than those of high school graduates). In contrast, we do not observe similar gradients for men, although men do rate women who attended the University of Tokyo favorably.

In Column 2, we add the respondent's educational attainment and two interactions, namely, the respondent's educational attainment being higher than that of the potential spouse (R Edu > S Edu) and the respondent's educational attainment being lower than that of the potential spouse (R Edu < S Edu). For men, the former interaction variable indicates female hypergamy, whereas the latter indicates hypogamy. Conversely, for women, the former indicates hypogamy, whereas the latter indicates hypergamy. For both men and women, neither of these interaction terms is statistically significant, which is inconsistent with Hypothesis 2. Finally, in Column 3, we examine a different specification to test Hypothesis 3, defining educational hypergamy or hypogamy by focusing on the upper end of the educational spectrum (i.e., the University of Tokyo). Since Hypothesis 3 focuses on male respondents, we present results exclusively for male respondents. When a potential spouse did not attend the University of Tokyo, we find that male respondents do not necessarily rate a potential partner either favorably or unfavorably if the partner's educational attainment exceeds that of the respondent (β=0.04, P value=0.43). Combining this coefficient with the interaction between the partner's educational attainment at

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[9] While the coefficients shown in Tables 1 and 2 represent the average marginal component effects (AMCEs), a conventional quantity of interest in conjoint experiments (Hainmueller et al. 2014), it is known that the interpretation of AMCEs in subgroup analyses is sensitive to the choice of reference category (Leeper et al. 2020). However, in this study, the reference category for the educational attainment attribute represents the lowest attainment; thus, we believe that comparing the other levels with the lowest level in the male and female subgroups has a theoretical rationale.

the University of Tokyo and educational hypogamy, the results indicate that the average

preference for educational hypogamy when the potential spouse graduated from the University of

Tokyo is consistent with our expectation (β=0.04+($-$0.20)=$-$0.16). Nevertheless, it is not

statistically significant at the 5% level (P value=0.16). These results do not support Hypothesis 3.

Robustness check

Since this analysis includes a sample of both never-married and married respondents, one

potential concern is that the responses of those who are already married may differ

systematically from those who have yet to marry. To explore whether the results are sensitive to

respondents' marital status, Figures A1−A3 in Supplementary Material D present ratings for

fictitious spouses' socioeconomic status among never-married respondents and married

respondents. Overall, we do not find systematic differences in response by marital status, except

for married women. For educational attainment, as shown in Figure A1, married respondents,

especially women, are more sensitive to fictitious spouses' educational credentials. For example,

female married respondents tend to favorably rate those who attended the nation's most selective

universities (the University of Tokyo or Waseda University). In contrast, we did not find many

differences with respect to marital status among men, except that married men rated women who

attended the University of Tokyo relatively higher. Looking at the employment status results

shown in Figure A2, we find that married women seem to rate those who work in a large firm as

regular employees more favorably than never-married women do, whereas they rate those who

work in nonstandard employment more unfavorably than never-married women do. Finally, the

income-based results are shown in Figure A3. Similar to educational attainment and work

arrangements, married women are also more sensitive to their potential partner's relative income

than unmarried women are. Specifically, married women are more likely to rate favorably those who earn three times their own income and to rate unfavorably those who earn half of their own income relative to never-married women. In contrast, we do not observe a clear difference in responses by marital status among men.

To summarize, the comparison between unmarried and married respondents suggests that married women are more sensitive to potential spouse traits than unmarried women are; however, we do not observe significant differences in marital status among men. This may reflect the fact that married women are often economically dependent on a male spouse, which may make them more sensitive to "potential" spouses' socioeconomic traits than women who have yet to experience the challenges of balancing work and family and its implications for their own economic independence. That said, our primary conclusion, i.e., that men's hypogamy and women's hypergamy preferences in terms of educational attainment are not observed, does not depend on respondents' marital status.

Discussion

This study makes both theoretical and empirical contributions to the literature on marriage market mismatches by providing experimental evidence on the role that spouse selection criteria may play in explaining marriage formation. While previous studies have considered the role of partner preferences, they have typically failed to quantify the magnitude or strength of these preferences. Our results suggest that partner preferences differ by gender; this outcome is consistent with prior research. Specifically, we find that women are more responsive than men are to potential spouses' income and work arrangements but not to educational attainment. Furthermore, our empirical findings reveal that educational attainment plays a relatively limited

role in partner preferences compared with the other two socioeconomic status measures. We believe this is an important finding that provides critical insights for future studies, in light of efforts in previous studies that primarily used educational attainment as a measure of status-based assortative mating and marriage market mismatches (Blossfeld 2009; Raymo and Iwasawa 2005; Schwartz 2013). Given that the other two socioeconomic measures play a critical role, future studies would benefit from examining multiple dimensions that contribute to assortative mating (e.g., educational attainment and income) rather than a single dimension so that researchers can compare the relative importance of these dimensions in the formation of assortative mating.

We also test the hypothesis that these gender-specific partner preferences vary by their own socioeconomic status. Our results on educational attainment do not support this hypothesis. While we expected that men would be more likely to prefer a potential spouse whose educational attainment is lower than their own, the results suggest the opposite (net of preferences for other characteristics). For women, we find inconsistent patterns regarding their evaluation of their partners' educational attainment; women who graduated from selective colleges rate both noncollege graduates and selective college graduates unfavorably. However, we do find that women are more responsive to potential partners' relative income than men are. Additionally, we identify heterogeneity based on marital status for women. Compared with men, women respond to potential partner characteristics differently in terms of their marital status. Specifically, married women are more sensitive to men's socioeconomic characteristics than unmarried women are.

To summarize, although previous studies have suggested that partner preferences play a role in the gendered patterns of marriage formation (e.g., more female hypergamy than female

hypogamy) and marriage market mismatches, our results do not find supportive evidence for heterogeneous preferences based on educational attainment. We believe that the lack of supportive evidence is crucial not only because educational attainment is the most carefully examined measure in the previous literature but also because the presence of heterogeneous preferences is a core assumption of the marriage market mismatch hypothesis.

There are at least three possible interpretations of these results. First, if our results suggest that heterogeneous preferences do not necessarily matter, at least for educational attainment, then this allows us to conclude that the observed pattern of assortative mating, including educational homogamy, hypergamy, and the emergence of hypogamy, is a product of opportunity structures rather than partner preferences. In the case of educational homogamy, studies have shown that similarly educated people tend to interact with each other (McPherson et al. 2001), live in neighborhoods with similarly educated individuals (Domina 2006), and meet their marital partners in schools (Kalmijn and Flap 2001), leading to educational homogamy. These studies suggest that differential opportunities, rather than differential preferences, are significant factors in the formation of assortative mating. This interpretation also provides important insights into the marriage market mismatch literature.

Second, these results may be constrained by the fact that we examine the role of educational attainment while also considering income and work arrangement, both of which are correlates of educational attainment. It is possible that the observed results discussed in previous studies, which suggest that educational attainment critically shapes marriage market mismatches, may reflect that people search for their future partner not necessarily on the basis of educational attainment itself but rather on characteristics that are correlated with educational attainment. However, owing to college expansion, the distribution of educational attainment has changed

more dramatically than that of income or work arrangements. Therefore, educational attainment plays a key role in marriage market mismatches through compositional changes in the marriage market.

Third, another interpretation, of course, is that the experimental design employed in this study may not have effectively measured what we intended to assess. Except for a few recent studies, such as the one by Zhou and Yu (2023), the current study is one of the few contributions to the mate selection literature that uses a survey experiment approach. It is possible that our analysis is underpowered due to having a sample size that is insufficient to accurately estimate heterogeneous effects. It could also be the case that the way in which we define the outcome of our study—the attractiveness of potential partners—may not be an appropriate measure for detecting differential preferences. We acknowledge this as a limitation of our study. Future research could benefit from exploring alternative definitions to measure partner preferences and from employing studies with greater statistical power, which may yield different results. Although our conclusion suggests that heterogeneous preferences do not significantly affect marriage market mismatches, alternative research designs might provide evidence that supports the relevance of these preferences in the marriage market and assortative mating. Another critical limitation of this study is that our findings are based on stated preferences and thus do not provide concrete evidence on either how heterogeneous partner preferences (do not) influence observed marriage market mismatches or the related implications for marriage rates.

Despite these limitations, we believe that this study has important implications for theoretical assumptions in the assortative mating and marriage market mismatch literature. Specifically, our survey experimental design, although based on a hypothetical scenario, allows us to separate partner preferences from opportunity structure, which is a key research agenda in

mate selection studies (Lichter and Qian 2019). This is an important contribution in light of previous studies, which have implicitly assumed that people have different partner preferences on the basis of their socioeconomic status, including educational attainment. This is an important necessary condition for the marriage market mismatch hypothesis (e.g., Raymo and Iwasawa 2005). Prior studies that have focused on online dating or marriage matching sites have shown that individuals are more likely to respond to messages from similarly educated people than from others (Lin and Lundquist 2013; Yu and Hertog 2018). Such behavior-focused studies provide supportive evidence for assortative mating. However, as we discussed earlier, the reciprocal nature of mate selection may explain the apparent inconsistencies between the findings of these previous studies and our results. This is because these behavioral outcomes (sending or responding to a message) may reflect both partner preferences and interactions constrained by opportunities. In contrast to these behavior-focused studies, our study contributes to the literature by estimating one's partner preference in isolation from other forces that shape mate selection processes. Given that relatively few extant studies have used a survey experiment approach to examine preferences separate from opportunity structure, the evidence from our research design outweighs the limitation regarding implications for observed union formation. While quantifying one's partner preference alone is not sufficient to examine the empirical reality of mate selection (Uchikoshi and Raymo 2021), this is an important first analytical step toward addressing questions about mate selection.

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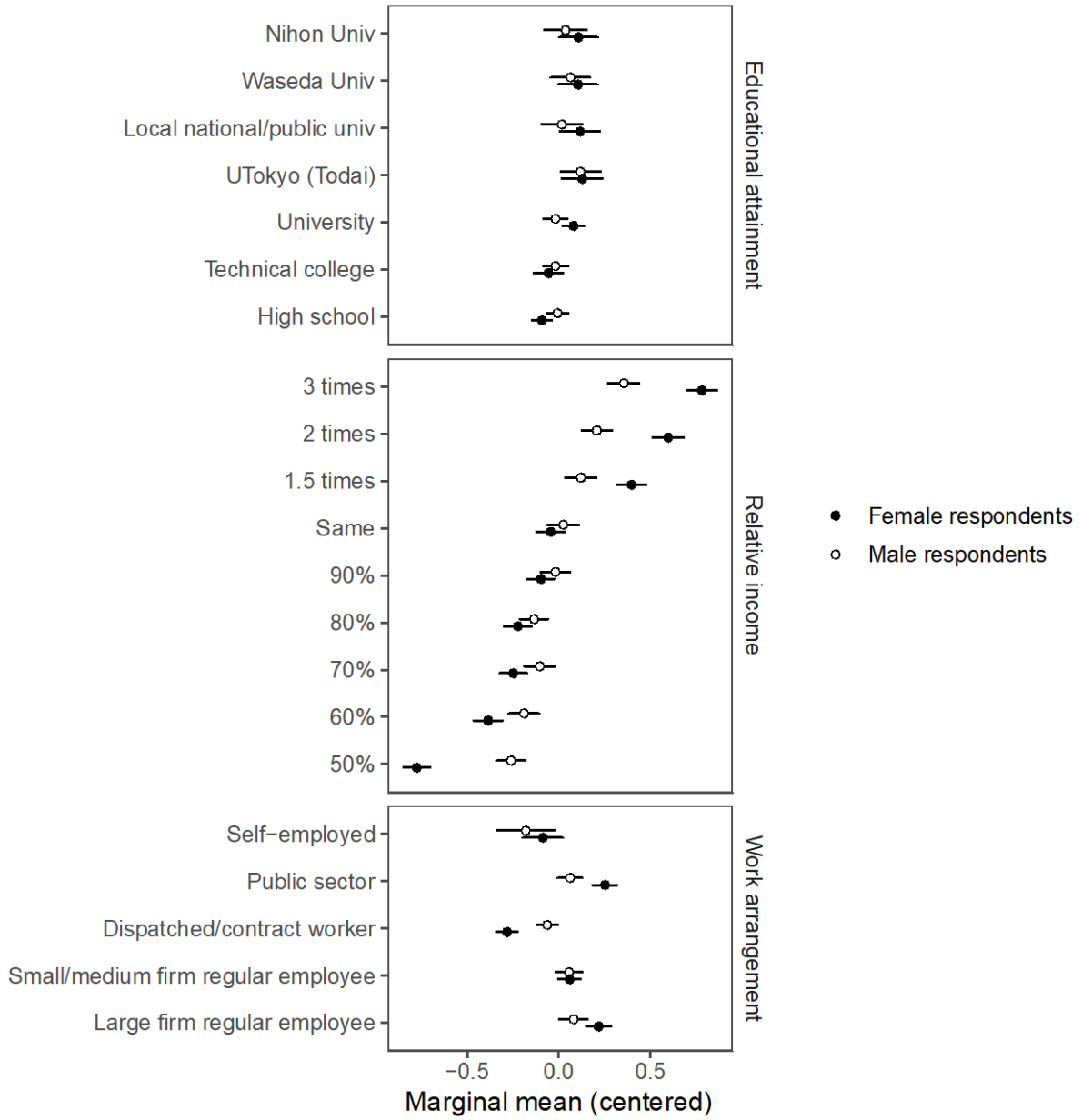 10.1177/2057150X231205372.

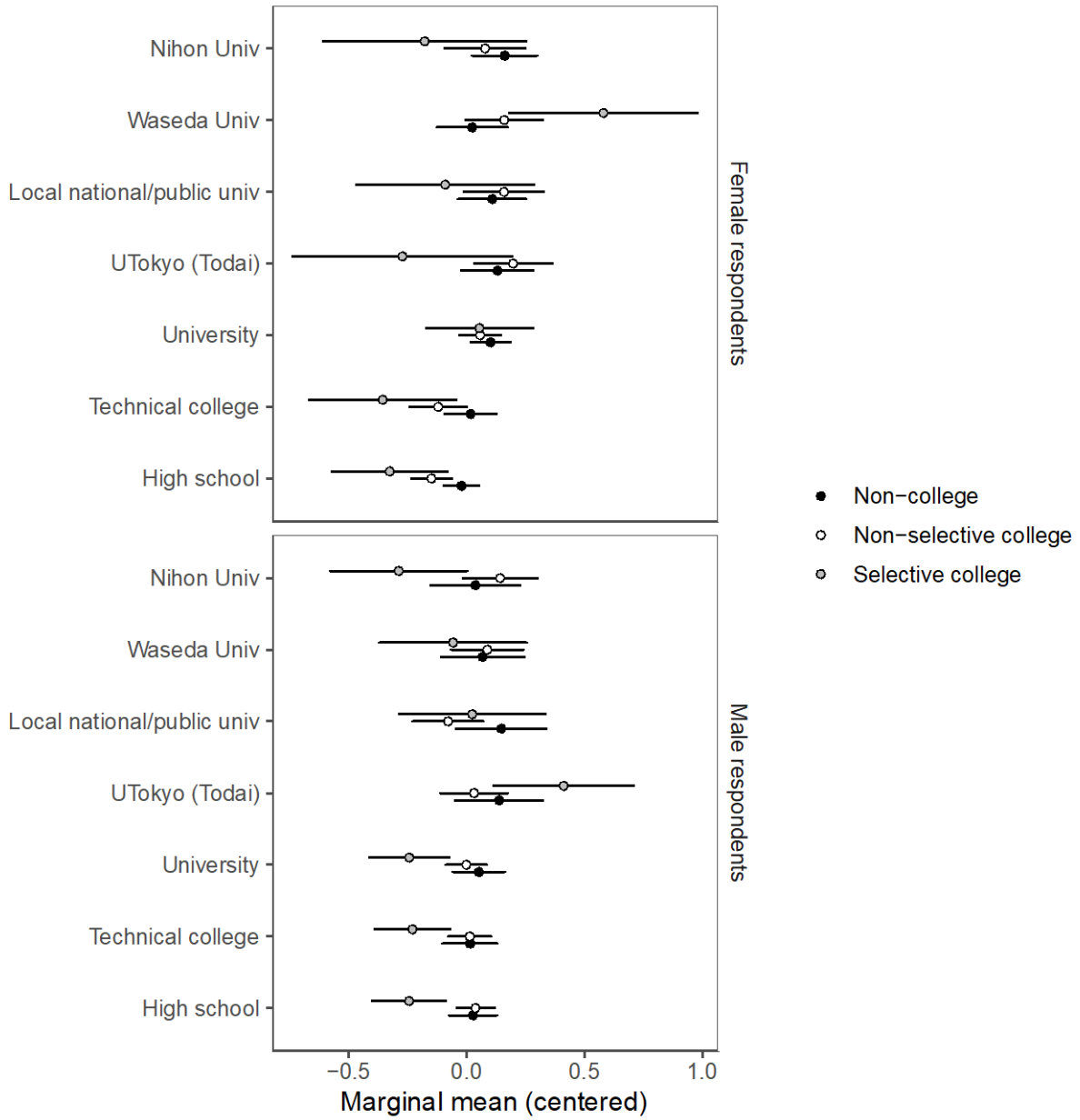Figure 1 Ratings for fictitious spouses' socioeconomic status

Figure 2 Ratings for fictitious spouses' educational attainment by respondents' educational attainment

Table 1 Regression results for respondents' ratings (men)

	Column 1			Column 2			Column 3		
	Beta	SE	P value	Beta	SE	P value	Beta	SE	P value
(Intercept)	4.20	0.10	0.00	4.07	0.14	0.00	4.04	0.11	0.00
Partner educational attainment (ref: high school)									
Partner: Technical college	-0.01	0.03	0.62	-0.02	0.03	0.41			
Partner: Four-year university	0.00	0.03	0.89	-0.02	0.03	0.63			
Partner: UTokyo	0.13	0.05	0.01	0.10	0.06	0.11	0.24	0.10	0.02
Partner: Local national/public university	0.03	0.05	0.55	0.00	0.06	0.97			
Partner: Waseda University	0.07	0.05	0.19	0.03	0.06	0.59			
Partner: Nihon University	0.05	0.05	0.38	0.04	0.06	0.51			
Partner work arrangement (ref: large firm regular)									
Partner: Small/medium firm regular employee	-0.04	0.04	0.26	-0.04	0.04	0.29	-0.04	0.04	0.28
Partner: Dispatched/contract worker	-0.15	0.03	0.00	-0.15	0.03	0.00	-0.15	0.03	0.00
Partner: Public sector	-0.04	0.04	0.29	-0.04	0.04	0.28	-0.04	0.04	0.28
Partner: Self-employed	-0.31	0.08	0.00	-0.30	0.08	0.00	-0.31	0.08	0.00
Partner relative income (ref: 50%)									
Partner: Income 60%	0.06	0.04	0.19	0.06	0.04	0.17	0.06	0.04	0.17
Partner: Income 70%	0.15	0.05	0.00	0.15	0.05	0.00	0.16	0.05	0.00
Partner: Income 80%	0.12	0.04	0.01	0.13	0.04	0.00	0.13	0.04	0.00
Partner: Income 90%	0.24	0.04	0.00	0.24	0.04	0.00	0.24	0.04	0.00
Partner: Income Same	0.27	0.05	0.00	0.27	0.05	0.00	0.27	0.05	0.00
Partner: Income 1.5 times	0.39	0.05	0.00	0.39	0.05	0.00	0.39	0.04	0.00
Partner: Income 2 times	0.46	0.05	0.00	0.46	0.05	0.00	0.46	0.04	0.00
Partner: Income 3 times	0.61	0.05	0.00	0.61	0.05	0.00	0.61	0.05	0.00
Respondent educational attainment (ref: national and public, very selective)									
Respondent: National and public univ, selective				0.04	0.13	0.75	0.05	0.06	0.44
Respondent: Other national and public univ				0.23	0.12	0.06	0.24	0.05	0.00
Respondent: Private univ, very selective				-0.05	0.18	0.79	-0.04	0.08	0.62
Respondent: Private univ, selective				0.12	0.13	0.37	0.12	0.06	0.03
Respondent: Other private univ				0.22	0.10	0.03	0.23	0.05	0.00
Respondent: Junior college				0.10	0.11	0.41	0.09	0.06	0.12
Respondent: High school or less				0.25	0.12	0.03	0.26	0.06	0.00
Educational assortative mating (ref: R=S)									
Edu R > Edu S				-0.05	0.05	0.32	-0.03	0.04	0.39
Edu R < Edu S				0.00	0.05	0.97	0.04	0.05	0.43
Partner: UTokyo * Edu R < Edu S							-0.20	0.12	0.09
# of ratings/respondents				23,584/1,474					

Note: All models include partner characteristics, i.e., age, sibship status, marital status, ideal division of labor, and the number of dating partners.

Table 2 Regression results for respondents' ratings (women)

	Column 1			Column 2		
	Beta	SE	P value	Beta	SE	P value
(Intercept)	1.41	0.09	0.00	1.45	0.19	0.00
Partner educational attainment (ref: high school)						
Partner: Technical college	0.03	0.04	0.42	0.00	0.04	0.93
Partner: Four-year university	0.16	0.03	0.00	0.12	0.04	0.00
Partner: UTokyo	0.20	0.05	0.00	0.14	0.06	0.02
Partner: Local national/public university	0.22	0.05	0.00	0.17	0.06	0.00
Partner: Waseda University	0.20	0.05	0.00	0.14	0.06	0.01
Partner: Nihon University	0.23	0.05	0.00	0.18	0.06	0.00
Partner work arrangement (ref: large firm regular)						
Partner: Small/medium firm regular employee	-0.13	0.03	0.00	-0.13	0.03	0.00
Partner: Dispatched/contract worker	-0.50	0.03	0.00	-0.50	0.03	0.00
Partner: Public sector	0.03	0.04	0.38	0.03	0.04	0.39
Partner: Self-employed	-0.29	0.05	0.00	-0.29	0.05	0.00
Partner relative income (ref: 50%)						
Partner: Income 60%	0.38	0.04	0.00	0.39	0.04	0.00
Partner: Income 70%	0.53	0.04	0.00	0.53	0.04	0.00
Partner: Income 80%	0.56	0.04	0.00	0.56	0.04	0.00
Partner: Income 90%	0.68	0.04	0.00	0.68	0.04	0.00
Partner: Income Same	0.74	0.04	0.00	0.74	0.04	0.00
Partner: Income 1.5 times	1.16	0.05	0.00	1.17	0.05	0.00
Partner: Income 2 times	1.38	0.05	0.00	1.38	0.05	0.00
Partner: Income 3 times	1.56	0.05	0.00	1.56	0.05	0.00
Respondent educational attainment (ref: national and public, very selective)						
Respondent: National and public univ, selective				-0.01	0.24	0.97
Respondent: Other national and public univ				0.17	0.18	0.35
Respondent: Private univ, very selective				-0.48	0.24	0.06
Respondent: Private univ, selective				-0.16	0.19	0.40
Respondent: Other private univ				-0.05	0.17	0.75
Respondent: Junior college				0.01	0.17	0.94
Respondent: High school or less				0.06	0.18	0.75
Educational assortative mating (ref: R=S)						
Edu R > Edu S				-0.05	0.05	0.31
Edu R < Edu S				0.02	0.05	0.74
# of ratings/respondents			23,616/1,476			

Note: All models include partner characteristics, i.e., age, sibship status, marital status, ideal division of labor, and the number of dating partners.

**Supplementary Material for
"Revisiting Marriage Market Mismatch:
A Conjoint Survey Experiment Approach"**

A. Survey Wording

Gender
What is your gender? (あなたの性別をお答えください。)

- Male (男性)
- Female (女性)
- Nonbinary/third gender (ノンバイナリー／第三の性別)
- Prefer not to say (回答したくない)

The respondents who select "Nonbinary/third gender" or "Prefer not to say" are not allowed to proceed with the subsequent questions because it would be difficult to implement the conjoint experiment focused on spouse preferences for these respondents.

Birth year and month
In what year and month were you born? (あなたのお生まれは何年何月ですか。)

Two dropdown lists for both year ("1973," "1974"..., "1998") and month (from "January" to "December) are provided.

Prefecture of residence
What is your prefecture of residence? (あなたが現在お住まいの都道府県名を教えてください。)

The respondents answer this question via a drop-down list that includes 47 prefectures and "Overseas." We exclude those who chose "Overseas" from the survey.

Sexual orientation
What gender(s) have you had romantic feelings for? (あなたはこれまで、どのような相手に対して恋愛感情を抱いてきましたか。)

- Only [women/men] ([女性/男性]のみ)
- Mostly [women/men] (ほとんどが[女性/男性])
- Equally men and women (男性と女性同じくらい)
- Mostly [men/women] (ほとんどが[男性/女性])
- Only [men/women] ([男性/女性]のみ)
- I have never had romantic feelings for either men or women (男女どちらにも恋愛感情を抱いたことがない)

- I don't know (わからない)
- Prefer not to say (答えたくない)

Options are arranged by respondents' gender. Respondents who select "Equally men and women," "I have never had romantic feelings for either men or women," "I don't know" or "Prefer not to say" are not allowed to proceed with the subsequent questions because it would be difficult to implement the conjoint experiment asking spouse preferences for these respondents. While respondents who state that they had a homosexual orientation are allowed to complete the survey, we do not use their data in our analysis, as per preregistration.

Attention check
We repeat this attention check twice. For respondents who do not follow the instructions in the first attempt, we repeat the question again by asking them to "Please select both 'Several times in a month' and 'Several times in a year' from the options" being presented in bold font. Those who fail to pass the second attempt are immediately excluded from the survey.

In recent years, an increasing number of people are obtaining news online instead of from newspapers. Here, we want to confirm that you carefully read the question texts. Regardless of how frequently you actually obtain news online, please select both "Several times in a month" and "Several times in a year" from the options. (近年、紙の新聞ではなくオンラインでニュースを得る人がどんどん増えてきています。ここで、あなたがきちんと質問文を読んでいるかどうかをテストしてみたいと思います。あなたが実際にどのくらい頻繁にオンラインでニュース情報を入手しているかどうかにかかわらず、選択肢のうち「月に何度か」と「年に何度か」の両方を答えとして選んでください。)
- Every day (毎日)
- Several times a week (週に何度か)
- Several times a month (月に何度か)
- Several times a year (年に何度か)
- Not at all (まったくない)

Educational attainment
Which was **the last** school you attended? (あなたが**最後に通われた**学校はどれですか。)
- Junior high school (中学校)
- High school (高等学校)
- Junior college (短期大学)
- College of technology (Kosen) (高等専門学校 （高専）)
- Technical college (専門学校)
- Four-year college (including medicine, dentistry, and pharmacy majors) (四年制大学（医・歯・薬学部を含む）)

- Graduate school (大学院)
- I don't know (わからない)

The respondents who selected "Four-year college" or "Graduate school" were asked the following "School type (1)" question.

School type (1)
Which of the following was **the last** school you attended? Please choose the answer that best applies. (あなたが<u>最後に通われた</u>学校は、以下のうちどれでしょうか。あてはまるものを選んでください。)
- National university/graduate school (国立大学・大学院)
- Public university/graduate school (公立大学・大学院)
- Private university/graduate school (私立大学・大学院)
- Other (e.g., National Defense Academy) (その他（防衛大学校など）)
- Overseas school (海外の学校)
- I don't know (わからない)

The respondents who select "National university/graduate school," "Public university/graduate school," or "Private university/graduate school" are asked the corresponding "School type (2)" question.

School type (2) for national universities
Which of the following is the name of **the last** university or graduate school you attended? Please choose the answer that best applies. (あなたが<u>最後に通われた</u>大学名または大学院名は、以下のうちどれでしょうか。あてはまるものを選んでください。)
- Hokkaido University, Tohoku University, the University of Tokyo, Nagoya University, Osaka University, Kyoto University, Kyushu University, Kobe University, Hitotsubashi University, the Tokyo Institute of Technology, or Tokyo Medical and Dental University (北海道大学、東北大学、東京大学、名古屋大学、大阪大学、京都大学、九州大学、神戸大学、一橋大学、東京工業大学、東京医科歯科大学)
- Chiba University, Tokyo University of Foreign Studies, Tsukuba University, Ochanomizu University, Yokohama National University, Niigata University, Kanazawa University, Hiroshima University, Nagasaki University, or Kumamoto University (千葉大学、東京外国語大学、筑波大学、お茶の水女子大学、横浜国立大学、新潟大学、金沢大学、岡山大学、広島大学、長崎大学、熊本大学)
- Other national university (その他国立大学)

School type (2) for public universities

Which of the following is the name of **the last** university or graduate school you attended?
Please choose the answer that best applies. (あなたが<u>最後に通われた</u>大学名または大学院名は、以下のうちどれでしょうか。あてはまるものを選んでください。)

- Tokyo Metropolitan University, Yokohama City University, Nagoya City University, Osaka City University, Osaka Prefecture University, or Kobe City University of Foreign Studies (首都大学東京（東京都立大学）、横浜市立大学、名古屋市立大学、京都府立大学、大阪市立大学、大阪府立大学、神戸市外国語大学)
- Other public university (その他公立大学)

School type (2) for private universities
Which of the following is the name of **the last** university or graduate school you attended?
Please choose the answer that best applies. (あなたが<u>最後に通われた</u>大学名または大学院名は、以下のうちどれでしょうか。あてはまるものを選んでください。)

- Waseda University, Keio University, Sophia University, or Tokyo University of Science (早稲田大学、慶應義塾大学、上智大学、東京理科大学)
- Meiji University, Aoyama Gakuin University, Rikkyo University, Chuo University, Hosei University, or Gakushuin University (明治大学、青山学院大学、立教大学、中央大学、法政大学、学習院大学)
- Kwansei Gakuin University, Kansai University, Doshisha University, or Ritsumeikan University (関西学院大学、関西大学、同志社大学、立命館大学)
- Other private university (その他私立大学)

Marital status
In the following section, we will ask you about personal matters, including your marital experience. While some of the questions may address private issues, the information gathered is crucial for understanding the changes in social relationships over time and for considering future policies. We kindly ask for your understanding of the purpose of this survey and for your cooperation. (以下では、結婚経験をはじめ個人的な事柄について伺います。立ち入った内容も含まれるかと思いますが、社会関係の時代的な変化を捉え、施策を考える上で大切な資料となります。調査の趣旨をご理解いただき、ご協力いただきますようお願いいたします。)

Are you currently married? This includes common-law marriages as well. (あなたは現在、結婚されていますか。ここでは、事実婚も含みます。)

- Never married (結婚したことがない)
- Married (with a partner) (結婚している（配偶者あり）)
- Divorced (離別した)
- Widowed (死別した)

Preliminary explanation of the conjoint experiment
From the next page onward, we will show you a brief description of two fictional individuals. Imagine that these two people are close to you. Please rate how attractive they are as a current potential marital partner. If you are currently married or have a partner, please answer as though you are single and without a partner. (次のページから、1ページにつき2人の架空の人物の簡単な説明をお見せします。この2人が、あなたの周りにいると想像してください。これらの人物が、あなたが今結婚する相手として、どれくらい魅力的かを評価してください。現在、結婚されていたり、恋人がいる方は、今の状況で独身かつ恋人がいないと仮定して答えてください。)

You will be shown eight similar tables in a row; however, the content of each table is not the same. Please read each table carefully before answering the questions. (同じような表が全部で8回表示されますが、それぞれの表の内容は同じものではありません。一つひとつの表をよくご確認の上、ご回答いただきますようお願いします。)

Conjoint experiment
Imagine that the following two people are close to you. (下記の2人が、あなたの周りにいると想像してください。)

[A conjoint table is displayed here. The two people are labeled A and B.]

If you were to rate them, how attractive would you think A and B are as marital partners for you? (もし点数を付けてもらうとすると、あなたにとってAさんとBさんはそれぞれ結婚相手としてどのくらい魅力的だと思いますか。)

The respondents are asked to answer this question on a seven-point scale with the labels "Not attractive at all" (全く魅力的ではない) and "Very attractive" (非常に魅力的) positioned at the ends of the pole. The task is repeated eight times per respondent.

The attributes and levels of the conjoint table are shown in Table A1. For the "Local national/public university" level of the "Educational attainment" attribute, the name of a specific university corresponding to the respondent's prefecture of residence is displayed. The list of these universities is shown in Table A2.

Table A1 Attributes and levels in the conjoint experiment

Attribute	Levels
Age (年齢)	22 (22)
	...
	(in one-year increments)
	...
	54 (54)
Sibship status (きょうだい構成)	Eldest daughter/son with a junior brother (長女・弟 1 人/長男・弟 1 人)
	Eldest daughter/son with a junior sister (長女・妹 1 人/長男・妹 1 人)
	Second daughter with a senior sister/Second son with a senior brother (次女・姉 1 人/次男・兄 1 人)
	Only child (一人っ子)
Educational attainment (最終学歴)	High school (高校)
	Technical college (専門学校)
	Four-year university (四年制大学)
	University of Tokyo (東京大学)
	Local national/public university (See Table A2)
	Waseda University (早稲田大学)
	Nihon University (日本大学)
Employment (仕事)	Regular employee in a large firm (大企業正社員)
	Regular employee in a large firm (中小企業正社員)
	Dispatched or contract worker (派遣・嘱託・契約社員)
	Public sector employee (官公庁)
	Self-employed (自営業)
Relative income (現在の収入)	50% of respondent's own income (あなたの収入の半分)
	60% of respondent's own income (あなたの収入の 0.6 倍)
	70% of respondent's own income (あなたの収入の 0.7 倍)
	80% of respondent's own income (あなたの収入の 0.8 倍)
	90% of respondent's own income (あなたの収入の 0.9 倍)
	Approximately equal to the respondent's own income (あなたの収入とほぼ同じ)
	1.5 times respondent's own income (あなたの収入の 1.5 倍)
	2 times respondent's own income (あなたの収入の 2 倍)
	3 times respondent's own income (あなたの収入の 3 倍)

Ideal division of domestic labor (その方が理想とする家事分担率)	Husband 0%, wife 100% (夫 0%、妻 100%) ... (in 10-percentage-point increments and decrements) ... Husband 100%, wife 0% (夫 100%、妻 0%)
The number of past dating partners (これまで交際した人数)	0 (0 人) ... (in one-person increments) ... 10 (10 人)
Marital status (離死別経験)	Never married (未婚) Divorced without children (離別+子どもなし) Divorced with children (離別+子どもあり)

Table A2 List of local national and public universities displayed in conjoint tables

Respondents' prefecture of residence	University
Hokkaido	Hokkaido University of Education (北海道教育大学)
Aomori	Hirosaki University (弘前大学)
Iwate	Iwate University (岩手大学)
Miyagi	Miyagi University of Education (宮城教育大学)
Akita	Akita University (秋田大学)
Yamagata	Yamagawa University (山形大学)
Fukushima	Fukushima University (福島大学)
Ibaraki	Ibaraki University (茨城大学)
Tochigi	Utsunomiya University (宇都宮大学)
Gunma	Gunma University (群馬大学)
Saitama	Saitama University (埼玉大学)
Chiba	Chiba University (千葉大学)
Tokyo	Tokyo Metropolitan University (東京都立大学)
Kanagawa	Yokohama National University (横浜国立大学)
Niigata	Niigata University (新潟大学)
Toyama	University of Toyama (富山大学)
Ishikawa	Kanazawa University (金沢大学)
Fukui	University of Fukui (福井大学)
Yamanashi	University of Yamanashi (山梨大学)
Nagano	Shinshu University (信州大学)
Gifu	Gifu University (岐阜大学)
Shizuoka	Shizuoka University (静岡大学)
Aichi	Aichi Prefectural University (愛知県立大学)
Mie	Mie University (三重大学)
Shiga	Shiga University (滋賀大学)
Kyoto	Kyoto Prefectural University (京都府立大学)
Osaka	Osaka Metropolitan University (大阪公立大学)
Hyogo	Kobe University (神戸大学)
Nara	Nara Prefectural University (奈良県立大学)
Wakayama	Wakayama University (和歌山大学)
Tottori	Tottori University (鳥取大学)
Shimane	Shimane University (島根大学)
Okayama	Okayama University (岡山大学)
Hiroshima	Hiroshima University (広島大学)
Yamaguchi	Yamaguchi University (山口大学)

Tokushima	Tokushima University (徳島大学)
Kagawa	Kagawa University (香川大学)
Ehime	Ehime University (愛媛大学)
Kochi	Kochi University (高知大学)
Fukuoka	Fukuyama City University (福岡県立大学)
Saga	Saga University (佐賀大学)
Nagasaki	Nagasaki University (長崎大学)
Kumamoto	Kumamoto University (熊本大学)
Oita	Oita University (大分大学)
Miyazaki	University of Miyazaki (宮崎大学)
Kagoshima	Kagoshima University (鹿児島大学)
Okinawa	University of Ryukyus (琉球大学)

B. Profile Distribution

The distribution of sibship status, educational attainment, employment (work arrangement), and marital status is set as shown in Figure A3. For educational attainment, strictly following the real-world distribution results in percentages for specific universities that are too small to test the hypotheses. Therefore, we first assign 5% each for the University of Tokyo, local national/public university, Waseda University, and Nihon University and assigned 80% proportionally to the remaining levels on the basis of the 2020 Population Census of Japan. For sibship status, the distribution is based on the Japanese National Fertility Survey. For employment and marital status, the distributions are based on the 2020 Population Census of Japan. A uniform distribution is used for the remaining attributes.

Table A3 Frequency distribution of each attribute

Attribute	Level	Distribution	
		For male resp. (female spouse)	For female resp. (male spouse)
Sibship status	Eldest daughter/son with a junior brother	0.287	0.274
	Eldest daughter/son with a junior sister	0.242	0.269
	Second daughter with a senior sister/Second son with a senior brother	0.262	0.269
	Only child	0.209	0.188
Educational attainment	High school	0.322	0.406
	Technical college	0.237	0.114
	Four-year university	0.241	0.280
	University of Tokyo	0.050	0.050
	Local national/public university	0.050	0.050
	Waseda University	0.050	0.050
	Nihon University	0.050	0.050
Employment	Regular employee in a large firm	0.143	0.199
	Regular employee in a large firm	0.179	0.265
	Dispatched or contract worker	0.455	0.329
	Public sector employee	0.200	0.162
	Self-employed	0.023	0.044
Marital status	Never married	0.857	0.934
	Divorced without children	0.080	0.059
	Divorced with children	0.063	0.007

C. Details of the Classification of the Relationships between Respondents' and Hypothetical Partners' Educational Attainment

Table A4 Assumed educational pairing patterns

Row: respondent's education Column: fictitious spouse's educational attainment	UTokyo	Waseda	Local national or public	Nihon	University	Professional Training College	High school
National, very selective	=	>	>	>	>	>	>
National and public, selective	<	<	> [1]	>	>	>	>
Other national and public	<	<	= [2]	>	>	>	>
Private, very selective	<	=	>	>	>	>	>
Private, selective	>	>	> [3]	>	>	>	>
Other private	<	<	<	<	=	>	>
Junior college	<	<	<	<	<	=	>
High school or less	<	<	<	<	<	<	=

Note 1) Supplementary analyses suggest that the results are robust to models where we assume pairings between selective national and public universities (respondents) and local national or public universities (spouses) to be homogamy.

Note 2) Supplementary analyses suggest that the results are robust to models where we assume pairings between other national and public universities (respondents) and local national or public universities (spouses) to be female hypogamy (if the respondents are male) or female hypergamy (if the respondents are female).

Note 3) Supplementary analyses suggest that the results are robust to models where we assume pairings between selective private universities (respondents) and local national or public universities (spouses) to be homogamy, female hypogamy (if respondents are male), or female hypergamy (if respondents are female).

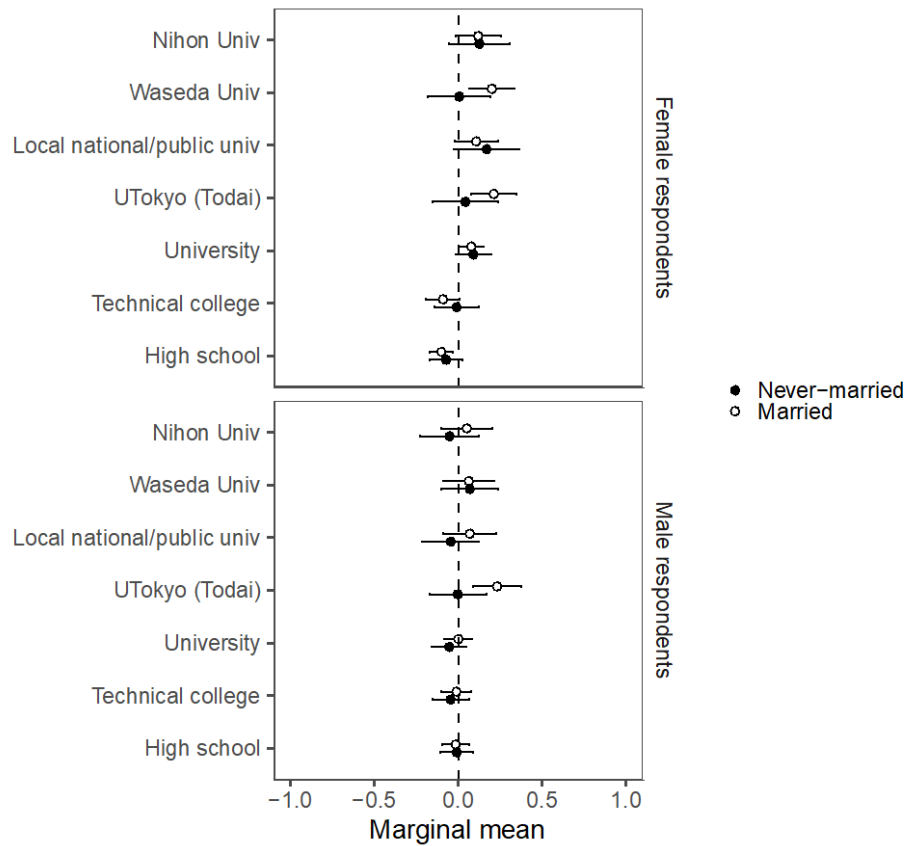**D. Analyses Separated by Respondents' Marital Status**

Figure A1 Ratings for fictitious spouses' educational attainment by respondents' marital status

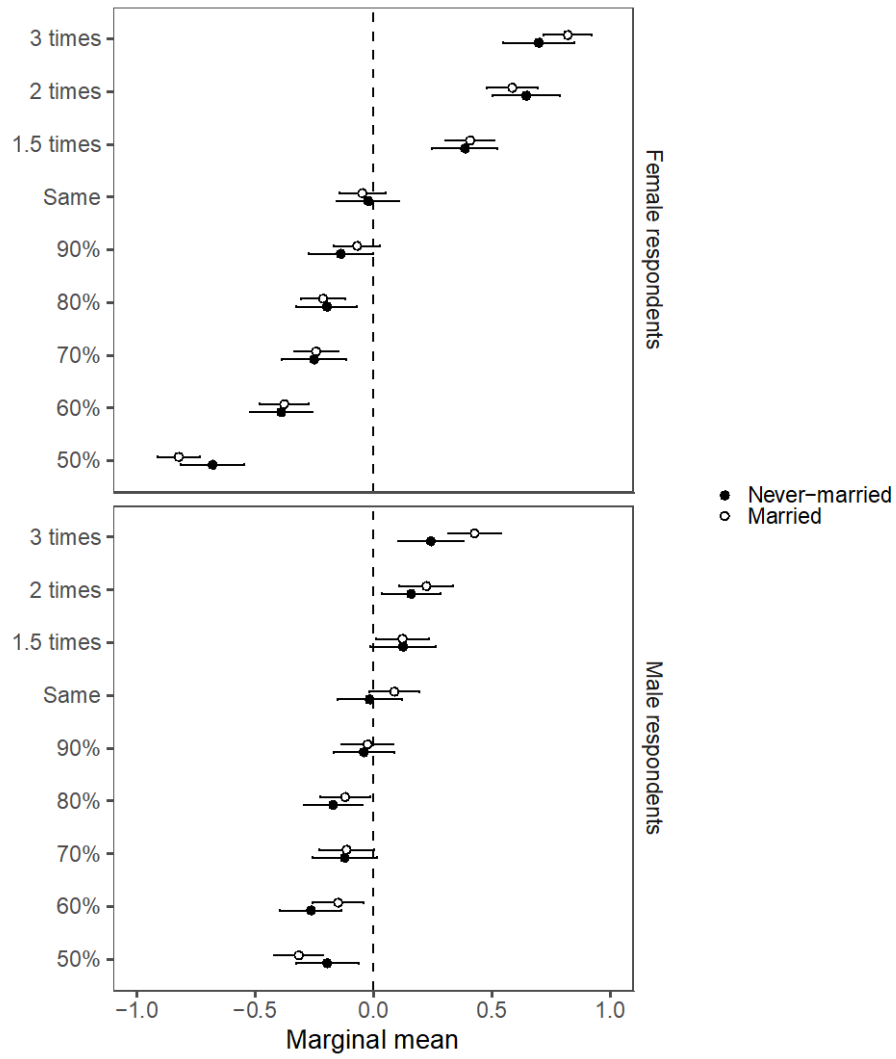Figure A2 Ratings for fictitious spouses' work arrangements by respondents' marital status

Figure A3 Ratings for fictitious spouses' relative income by respondents' marital status