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Higher education, lower satisfaction: hypogamy and traditional norms in Japan

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Abstract

This paper examines whether traditional gender norms are associated with well-being penalties for the rising share of women who are more educated than their husbands (hypogamy). Using panel data from the Japanese Panel Survey of Consumers (JPSC) covering the period of 1993 to 2020, the results show that women in hypogamous marriages report lower life satisfaction than other married women. The negative association is less pronounced for more recent marriage cohorts, as well as for women with less traditional norms. Moreover, the association shows stronger negative well-being implications for hypogamous women whose intra-household role is not in line with norm-based expectations.

Keywords Gender · Educational Hypogamy · Traditional Social Norms · Life Satisfaction

JEL Classification I26 · I31 · J12 · J16

1 Introduction

Marriage is typically associated with higher levels of life satisfaction. However, when male dominance within the household is challenged by women assuming a more prominent role in the labor market, potential negative well-being outcomes are well documented, particularly in societies characterized by traditional gender norms. These effects are often observed when women approach or exceed their husbands' earnings or market work hours, and some evidence suggests that women may actively avoid

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such situations.¹ This paper examines the more inelastic dimension of intra-household imbalance where a wife is more highly educated than her husband, referred to as hypogamy.

Having a higher education suggests a greater aptitude for the wife to engage in the labor market efficiently compared to her husband, which may affect optimal time allocation within the household. Building on Becker's theory of household specialization, differences in educational attainment may imply a reversal of traditional roles, with women specializing more in market work and men in household production. However, such reallocation often fails to materialize in practice, particularly in societies where traditional gender norms remain strong. Akerlof and Kranton explained this issue in their 2000 article on the implications of a social identity. In line with such norms, men's labor supply and engagement in household work tend to be relatively inelastic, which can prevent efficient adjustments and generate frictions within households.²

Accordingly, I hypothesize that hypogamous relationships are associated with lower life satisfaction for women in the presence of traditional attitudes. Conceptually, lower life satisfaction in hypogamous marriages may arise through several, partly overlapping channels. First, broader social pressures and perceived stigma may affect well-being by shaping how hypogamous relationships are evaluated by peers and society. Second, partner responses may play a role if husbands react negatively to an educational imbalance, for instance, through reduced support or conflict within the household. Third, dissatisfaction may stem from women's own internalized expectations about appropriate gender roles, leading to psychological costs when educational or labor market roles deviate from these norms. While these channels are closely intertwined, the empirical analysis examines their joint association with life satisfaction and explores heterogeneities and household-level patterns that help to disentangle these mechanisms.

The empirical analysis uses the Japanese Panel Survey of Consumers (JPSC), which provides rich information on women's life satisfaction, household dynamics, and traditional attitudes. Rising female educational attainment has contributed to a growing literature on assortative mating and the increasing prevalence of hypogamy in many societies (see, for example, Esteve et al. (2016), and Gihleb and Lifshitz (2025) for a comprehensive review). Yet, relatively little is known about how hypogamy, as a specific form of educational imbalance, relates to women's well-being. This paper contributes to the literature by focusing on hypogamy as a distinct and relatively inelastic form of intra-household imbalance and by examining how its association with women's life satisfaction depends on traditional gender norms. It shows that hypogamy is associated with lower life satisfaction among women. The association is heterogeneous, as more recent and shorter marriages are not related to lower life sat-

¹ The literature is extensively reviewed in the next section, but see, for example: Flèche et al. (2020) show that women who work more than their partners make up for it with comparatively longer hours of work in the household; Bertrand et al. (2020) indicate utility losses for skilled and working women in traditional societies; Foster and Stratton (2021) find that partnerships with female breadwinners are still less healthy and stable, but that the relationship is less pronounced than in older research.

² Consistent with the notion of relatively inelastic male labor supply, a simple log–log regression using JPSC data estimates the elasticity of daily work hours with respect to education. Controlling for age as well as year and prefecture fixed effects, the estimated elasticity is approximately 0.09 for men and 0.29 for women.

isfaction, while the negative association is more pronounced in earlier marriage years and longer-lasting marriages. Having higher education is still beneficial to women, even in the context of hypogamy. Yet, the higher the educational distance between hypogamous partners is, the more negative the well-being implications for women are. The negative association is stronger for those aligned with traditional gender norms. A further investigation of norm-related strain on well-being shows that traditional or more egalitarian expectations are mirrored in differentiating findings regarding relative financial and time use shares, and that these are more pronounced for hypogamous women.

Japan presents a compelling case for studying hypogamy, life satisfaction, and traditional norms. First, understanding factors that are detrimental to marital well-being is of particular importance in the Japanese context, given persistently low fertility and the strong link between marriage and childbearing, as non-satisfactory influences may disrupt marital stability. Second, the Japanese context represents a particularly informative case due to the coexistence of high female educational attainment and persistent traditional gender norms. This combination makes Japan a valuable setting to study how educational imbalances within couples interact with social norms to shape women's life satisfaction, while maintaining relevance for a broader set of societies experiencing similar demographic shifts.

Section 2 provides background information on social norms, well-being, education, and the Japanese context. Section 3 introduces the data and empirical strategy. Section 4 presents the main results, including heterogeneities related to traditional attitudes and potential mechanisms. Section 5 discusses the findings before Sect. 6 concludes.

2 Background

2.1 Societal expectations, educational differences and well-being

Akerlof and Kranton (2000) provide a theoretical foundation for the economic analysis of social norms by modeling utility losses from deviating from socially prescribed behavior. Their framework highlights how gender norms can shape labor market behavior and intra-household allocations. Subsequent research has built on this approach to study how persistent norms affect economic outcomes within couples.

A large body of literature documents how traditional social norms generate societal pressure that affects women's labor supply and intra-household allocations, often leading to inefficient outcomes. Evidence from Japan shows that norms prescribing women's primary role in home production continue to influence market work decisions, even as economic opportunities for women expand (Ando 2021; Sakamoto and Kohara 2024). Cross-national evidence links traditional norms to lower marriage rates of highly skilled women, while their relaxation is connected to improved female labor-market outcomes and more equal educational attainment (Bertrand et al. 2020; Du et al. 2021; Rodríguez-Planas and Tanaka 2022; Hara and Rodríguez-Planas 2025). Such traditional labor and household related norms tend to persist across generations and can coexist even among rapid developments of economic conditions (Hwang 2016; Schmitz and Spiess 2021).

Beyond broader societal pressure, husbands' expectations play an important role in shaping intra-household dynamics. Women tend to avoid earning more than their husbands and report lower marital satisfaction when they do so, a pattern observed across different institutional contexts (Bertrand et al. 2015; Sprengholz et al. 2020; Hederos and Stenberg 2022; Sakamoto and Minami 2024). Even when women provide more market work or earn more than their partners, men do not increase their contribution to housework and women do not reduce theirs, a pattern associated with lower life satisfaction and relationship strain, particularly when husbands have lower educational levels (Flèche et al. 2020; Foster and Stratton 2021; Steiber and Siegart 2026).

Women's expectations are also important in the context of societal norms. Educational differences may generate dissatisfaction not only through housework allocation but also through limited partner support for job-related demands and higher relationship expectations (Piao et al. 2021; Booysen et al. 2022). On the other hand, evidence from South Korea suggests that anticipated labor market discrimination moderates the well-being consequences of educational under-utilization for women (Ahmed Lahsen et al. 2024). This pattern may lead to less negative well-being implications in societies where higher average levels of female education may foster a better understanding of potential drawbacks and how to navigate them.

Evidence focusing on hypogamy and its link to subjective well-being remains limited. For Japan, hypogamy is associated with lower well-being among women, often attributed to strong gender role divisions, although the role of norms is not directly examined (Sato 2017; Ma and Piao 2019). Cross-national evidence suggests that hypogamy is more strongly associated with lower life satisfaction or depression in traditional societies, while these associations weaken in contexts with stronger institutional support and female empowerment (Potarca and Rossier 2021; Piao et al. 2021). In contrast, some studies find no adverse or even positive well-being effects of hypogamy (Chen 2018; Booysen et al. 2022). Moreover, a substantial literature on marriage and subjective well-being shows that larger educational differences between spouses are associated with lower life satisfaction compared to more educationally homogamous couples (Stutzer and Frey 2006; Hu et al. 2024).

While negative well-being associations may suggest that hypogamous unions are more fragile, evidence on marital stability is mixed and context-dependent. For example, Theunis et al. (2018) show that hypogamous marriages are not less stable in Belgian regions where hypogamy is more common, whereas earlier studies that did not account for such contextual factors report higher dissolution risks (see, for example, Schwartz and Han 2014). This distinction underscores that reduced well-being in hypogamous relationships does not necessarily translate into lower marital stability when hypogamy does not constitute a pronounced deviation from prevailing norms.

Further literature studies the rise of hypogamy as a consequence of increasing female educational attainment and changing assortative mating patterns or behavioral adjustments within couples (Esteve et al. 2016; van Bavel et al. 2018; Miller 2020; Han 2022; Uchikoshi 2022; Trimarchi 2022; Gihleb and Lifshitz 2025). Despite this extensive body of research, evidence on how hypogamy relates to subjective well-being remains scarce. In particular, existing studies rarely examine how traditional gender norms condition the well-being consequences of hypogamous relationships,

often because such norms cannot be directly measured. This paper overcomes this limitation by directly measuring traditional gender norms.

2.2 Japanese context

Female educational attainment in Japan has increased substantially over recent decades, a pattern also reflected in the sample used in this paper. In 1993, around 10% of women held a college degree or higher, a share that more than doubled by 2020 (Fig. 1). In contrast, male educational attainment has remained comparatively stable. At the same time, marriage rates have declined sharply, from more than 10 marriages per 1000 population in the early 1970s to around 4 per 1000 in the 2020s, while the average age at first marriage increased from about 27 to 31 for men and from 24 to nearly 30 for women (Statistics Bureau, Ministry of Internal Affairs and Communications 2025).

These trends increase the likelihood of educational mismatches within couples. Consistent with a marriage squeeze mechanism (Han 2022), recent studies document a rising share of hypogamous marriages in Japan (Fukuda et al. 2020, 2021; Uchikoshi 2022). In the JPSC data, hypogamous unions remain the least common marriage type, but their share increased by about 13% relative to 1993, while hypergamous and homogamous unions declined by roughly 3.7% and 4.6%, respectively. Homogamy remains the dominant marriage type in 2020 at close to 40%, followed by hypergamy at about one-third and hypogamy at around 28%.

Given that births outside marriage remain extremely rare in Japan, accounting for less than 3% of all births in 2020 (OECD 2022), changes in marital composition and related life satisfaction differences are closely tied to broader demographic challenges. In a context of record-low fertility (NHK World - Japan 2025), factors that affect marital quality may therefore have implications beyond individual households.

Traditional gender norms in Japan have adapted only slowly to economic change. Despite rising female educational attainment and labor market opportunities, prevailing expectations continue to emphasize men's role as primary earners and women's responsibility for household production, a pattern often traced to long-standing cultural norms (Lebra 2007; Hwang 2016; Belarmino and Roberts 2019).

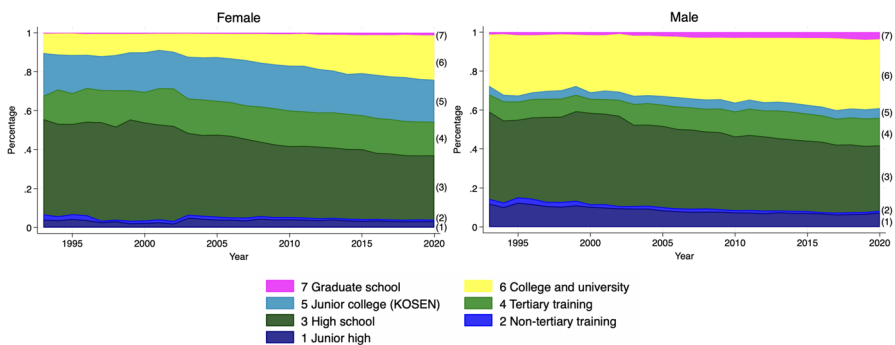


Fig. 1 Educational attainment of females and their spouses over time. *Note:* the figure is based on own calculations with Japanese Panel Survey of Consumers (JPSC) data

The World Values Survey (2022) underlines the persistence of traditional labor market attitudes in Japan. In the most recent wave, around 25% of respondents agree that men should have priority in employment when jobs are scarce, a share more than ten percentage points higher than in Germany and substantially above levels observed in the United States and Sweden (Online Appendix Fig. A-1 illustrates these findings).

While traditional norms remain comparatively strong, female labor market participation has increased, and policy reforms have reduced gender gaps in recent years (Oishi 2019; Saito 2024; Hara and Rodríguez-Planas 2025). Reflecting tensions between economic opportunity and societal expectations, Japan ranks 120th out of 146 countries in the Global Gender Gap Index for economic participation, driven by persistent wage gaps and low female representation in senior positions (World Economic Forum 2024), making it a particularly interesting setting to investigate implications of hypogamy and traditional norms.

3 Data and methodology

I use the Japanese Panel Survey of Consumers data from waves 1 to 28 (1993–2020). The JPSC is a panel study for female respondents only. Since only female respondents receive questionnaires and provide answers, information on men is limited to married women's reports of objective measures about their husbands.³ The data was collected by the Institute for Research on Household Economics until 2017 and by the Panel Data Research Center at Keio University since then. The survey contains data from a total of 4120 women who entered the study in five cohorts,⁴ resulting in an unbalanced panel in which individuals may enter through later cohorts or leave the survey over time. Accordingly, the panel starts with an original number of 1500 respondents in 1993, which developed into 1898 individual respondents in 2020. The women added in each cohort are aged 24 to 34 in the first panel and 24 to at most 29 in the later cohorts. Participants remain in the sample for more than 19 years on average, allowing the analysis to benefit from long observable spells, while later cohorts help capture more recent developments. As cohabitation outside of marriage is not common in Japan and usually only a prelude to marriage,⁵ and only married individuals provide information about their spouse, the sample is restricted to married individuals who live together with their husbands.

³ Therefore, data on subjective questions, such as life satisfaction, is only available for women, while relatively objective measures like working hours, or the profession of the husband, are available.

⁴ After the original 1500 respondents in 1993, 500 people were added in 1997, 836 in 2003, 636 in 2008, and 648 in 2013.

⁵ The share of not yet married women (men) between the age of 18 to 34 years who have lived together with a romantic partner before was below 9% (7%) in 2021 (National Institute of Population and Social Security Research (2022)) and cohabitating couples only constitute less than 1% in all couples living together (ISSP Research Group (2012)). In the underlying sample, the exclusion of non-cohabitating individuals after dropping missing values decreases the sample by 636 observations (2.43%). See Raymo et al. (2009) for further information on cohabitation in Japan.

3.1 Definition of variables

The dependent variable measures a respondent's life satisfaction. Respondents answer whether they are generally satisfied with life on a five-point scale from 1 (not at all) to 5 (very much).⁶ For ease of interpretation, I standardize life satisfaction to have a mean of zero and standard deviation of one.

The main explanatory variable, hypogamy, indicates whether the respondent's educational attainment exceeds that of her husband. Education is measured by the highest completed level at the last school attended and ranges from 1 (junior high school) to 7 (graduate school).⁷ Hypogamy is coded as 1 if the respondent's education exceeds her husband's and 0 otherwise. I define hypogamy broadly as any case where the wife is more educated than the husband, rather than focusing only on university-educated women. This definition matches the paper's focus on the direction of the educational mismatch, which is associated with relatively stronger labor market opportunities for hypogamous women and, in turn, with the potential for household frictions emphasized by Akerlof and Kranton (2000).

The control variables are grouped into four distinct categories, which are added sequentially to the main regression to examine systematic differences within each group. The first category includes interview year indicators and the respondent's education level. Conditioning on the respondent's education ensures that hypogamy captures her relative educational position within the couple.⁸

The second category includes respondent characteristics: age (level and squared), monthly income, work hours per workday, and occupation type (with full-time housewife as the reference category). Full-time housewives constitute close to 30% of observations, so excluding them would remove a substantial and important share of the sample.

The third category includes variables connected to the children and the household. The variable indicating the number of children living in the household is added. The JPSC asks respondents how many children live in the household without indicating age boundaries for these children, leading to over 30% of children in households being High School students or older. As young children are most care intensive,⁹ a second variable related to the children that indicates the life stage of the youngest child is

⁶ The numeric values of the answers are inverted in the raw data, but recoded in our sample so that higher values indicate higher life satisfaction.

⁷ The levels of schooling are (1) junior high school, (2) vocational school or specialized training college (non-tertiary education), (3) high school, (4) vocational school or specialized training college (tertiary education), (5) junior college or colleges of technology (KOSEN), (6) university (4 years), and (7) graduate school.

⁸ The husband's education is not included in the baseline specification by design. Conditioning on the respondent's education implies that hypogamy captures the woman's relative educational position within the couple. Including both partners' education would change the estimand from relative educational position to specific educational pairings. The focus of this paper is therefore on the direction of educational mismatch rather than on absolute combinations of partners' education, following Miller (2020).

⁹ See, for example, OECD (2016).

included.¹⁰ Hours spent on housekeeping and childcare are included, as well as the prefecture the respondent lives in.¹¹

The fourth category includes spousal characteristics to account for differences in household resources and time constraints that may independently affect women's life satisfaction and may differ systematically between hypogamous and non-hypogamous couples: the husband's monthly income, his work hours, his hours spent on housework and childcare per workday, and his occupation (with unemployment as the reference category).¹²

I exclude observations with missing values.¹³ The main estimation sample contains 25,514 observations from 2600 individuals, including 6929 observations (694 individuals) of hypogamous women and 18,585 observations (1917 individuals) of non-hypogamous women.¹⁴

3.2 Model

I report OLS estimates with standardized life satisfaction as the dependent variable. To account for the ordinal nature of the underlying life satisfaction measure, I additionally estimate Ordered Probit models as a robustness check. The baseline specification is given by:

$$LS_{it} = \beta_0 + \beta_1 Hypo_{it} + \beta_2 X_{it} + \lambda_t + \lambda_p + \varepsilon_{it}, \quad (1)$$

where LS_{it} denotes the standardized life satisfaction of individual i observed in year t . $Hypo_{it}$ equals 1 if the respondent lives in a hypogamous marriage and 0 otherwise. X_{it} is a vector of control variables described in the previous section. λ_t and λ_p denote year and prefecture fixed effects, respectively, and ε_{it} is the error term.

Hypogamy is largely time-invariant in the data. Only 11 individuals, accounting for 136 observations (0.53% of the sample), change their hypogamy status due to remarriage. Given this limited within-individual variation, individual fixed effects are not informative for the main analysis. In a robustness check, the sample is selectively expanded to allow specifications with greater within-individual variation, including fixed effects. This exercise comes at the cost of excluding important covariates and

¹⁰ Following the survey design, the base category of the youngest child's life stage "0" includes those with no children and those who have not given a response. The rest of the categories are (1) 0 years old, (2) 1–3 years old, (3) 4 years old until school enrollment, (4) elementary school years 1 to 3, (5) elementary school years 4 to 6, (6) junior high school students, and (7) high school students or older.

¹¹ There are 47 prefectures in Japan. Couples living in a foreign country are coded as 48. In the sample, 7 individuals with 30 observations are living abroad with their husbands.

¹² Following the approach for women, being unemployed is included as the reference category. Labor market-related differences between genders are salient: while close to every third observation for women is "housewife," an analogous "housekeeper" category is not available for men, and unemployed husbands comprise less than 2% of observations.

¹³ I do not exclude improbable but theoretically feasible answers (e.g., indicating 24h of housework). These answers are rare, and excluding them would require imposing an arbitrary cutoff.

¹⁴ There is a difference of 11 individuals between the hypogamy categories and the overall sample count. These individuals leave and re-enter the sample with a different partner while changing hypogamy status. This is briefly discussed in the model section.

is therefore interpreted as complementary to, rather than a substitute for the main results. Heterogeneity analyses further exploit the panel structure through targeted sample splits and interactions.

3.3 Descriptive evidence for the main sample

Before turning to the regression results, I present descriptive statistics for the main estimation sample. These statistics provide a first overview of the differences between hypogamous and non-hypogamous marriages. Table 1 reports summary statistics for the main estimation sample. Hypogamous women account for 27.16% of all observations.

Compared to non-hypogamous women, hypogamous women are slightly younger and have higher educational attainment. Their average life satisfaction is about 0.16 standard deviations lower than that of non-hypogamous married women. Hypogamous women also exhibit higher labor market involvement, reflected in higher incomes and longer working hours, while their husbands earn less on average. Husbands in hypogamous marriages contribute significantly more time to housework and childcare on average, but absolute differences are small in magnitude.

Additional descriptive statistics on educational attainment and its association with life satisfaction are reported in Online Appendix Table A-1. The table shows a positive

Table 1 Summary statistics for the main estimation sample

	All observations				hypogamous mean	non-hypogamous mean	T-test (col. 5 – col. 6) (7)
	mean (1)	s.d (2)	min (3)	max (4)			
Life satisfaction (std)	0.000	1.000	−2.629	1.568	−0.120	0.045	−0.164***
Hypogamy	0.272	0.445	0	1	1	0	
Education	4.043	1.306	1	7	4.502	3.872	0.630***
Age	38.762	7.963	24	61	38.496	38.861	−0.365***
Monthly income	8.859	9.291	0	180	9.762	8.522	1.240***
Work hours	4.755	3.652	0	19	5.057	4.643	0.414***
Housework hours	5.856	4.026	0	24	5.843	5.860	−0.017
Number of children	1.728	1.025	0	7	1.776	1.710	0.065***
Youngest child life stage	3.576	2.393	0	7	3.478	3.613	−0.135***
Monthly income spouse	29.447	15.477	0	600	27.251	30.266	−3.015***
Work hours spouse	9.859	2.427	0	24	9.706	9.916	−0.210***
House care hours spouse	0.583	1.141	0	24	0.645	0.559	0.086***
Observations	25,514				6929	18,585	
Individuals	2600				694	1917	

Notes: this table shows summary statistics for the main estimation sample. The observation period is 1993–2020. In columns (1)–(4), I show statistics for the whole sample, in column (5) for hypogamous females, and in column (6) for non-hypogamous females. Column (7) shows the difference in means between columns (5) and (6). Not depicted are the controls for the respondent's occupation, the spouse's occupation, the prefecture of the household, and the interview year. Significance levels of the differences in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

unconditional association between education level and life satisfaction. Observations from hypogamous marriages are present at all education levels above the lowest level of junior high school.

Overall, the descriptive statistics indicate various differences in socioeconomic characteristics between hypogamous and non-hypogamous marriages, as well as a negative unconditional association between hypogamy and women's life satisfaction. The regression analysis in the following section examines whether this association persists once observable characteristics are taken into account.

4 Results

4.1 Baseline association

Table 2 reports the estimation results from OLS models (Panel (A)) and Ordered Probit models (Panel (B)) for the main estimation sample. Column (1) presents the association between life satisfaction and hypogamy, controlling for interview year and the respondent's education level. Across specifications, the estimated coefficients are negative and statistically significant. The sequential inclusion of respondent characteristics (column (2)), household characteristics (column (3)), and spousal characteristics (column (4)) reduces the coefficient's size but does not alter its sign or statistical significance.

Table 2 Relationship between hypogamy and life satisfaction

	(1)	(2)	(3)	(4)
<u>Panel (A): OLS</u>				
Hypogamy	−0.255*** (0.041)	−0.244*** (0.039)	−0.230*** (0.039)	−0.137*** (0.039)
<u>Panel (B): OProbit</u>				
Hypogamy	−0.271*** (0.044)	−0.265*** (0.043)	−0.250*** (0.043)	−0.149*** (0.044)
<u>Control variables:</u>				
Basic controls	Yes	Yes	Yes	Yes
Personal controls	No	Yes	Yes	Yes
Home controls	No	No	Yes	Yes
Spouse controls	No	No	No	Yes
Observations	25,514			
Individuals	2600			

Notes: this table shows the partial correlation between hypogamy and life satisfaction. The observation period is 1993–2020. The basic controls include year fixed effects and the educational level of the respondent. The personal controls include the age (level & quadratic terms), own monthly income, occupational categories, with being a housewife as a reference, and work hours per work day. Home controls refer to the number of children living in the household, the life stage of the youngest child, the hours spent on childcare and household chores, as well as the prefecture the couple lives in. Controls related to the spouse include the occupational categories with being unemployed as reference, his monthly income, and the work hours per work day. Standard errors (clustered at the individual level) in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The results show that hypogamous women report lower life satisfaction than other married women. The Ordered Probit estimates yield qualitatively similar findings.¹⁵ Online Appendix Table A-2 reports marginal effects showing that hypogamous women are less likely to report the highest satisfaction levels and more likely to report lower satisfaction levels.¹⁶ The estimated coefficients on the control variables are in line with prior findings and are reported in Online Appendix Table A-4, which presents the full results for the specification in column (4). Higher own and spousal income are positively associated with life satisfaction, while longer working hours and a greater burden of housework are negatively related to well-being. Life satisfaction follows the expected non-linear pattern over age.

4.2 Robustness

The baseline results document a robust negative association between hypogamy and women's life satisfaction. A remaining concern is that sorting into hypogamous marriages is not random but may reflect selection on observable and unobservable characteristics that are jointly related to marital matching and well-being. I therefore subject the baseline findings to a series of robustness checks that address different dimensions of selection. First, I account for selection on observables using entropy balancing to construct a more comparable control group. Second, I assess the impact of hypogamous marriages and the broader role of marriage among individual fixed effects after the inclusion of singles. Finally, I examine the robustness of the results to selection on unobservables using a coefficient stability analysis following Oster (2019).

Introducing entropy balancing (EB) weights, following Hainmueller (2012),¹⁷ yields the results depicted in Table 3.¹⁸ Compared to the results from column 4 of Table 2, the entropy-balanced estimates differ only slightly in magnitude. The more negative coefficients reflect that observable differences between hypogamous and non-hypogamous women may mask part of the association in the baseline specification. Once these compositional differences are accounted for, the negative relationship between hypogamy and life satisfaction becomes more pronounced.

By construction, the hypogamy indicator relies on information on the husband's education, which is only available for married women, rendering the inclusion of singles in the main analysis conceptually inappropriate. To nevertheless benchmark hypogamy against being unmarried, I estimate specifications that include single women and individual fixed effects, omitting spousal covariates. The resulting sam-

¹⁵ The results are also confirmed using a linear Random Effects model, as in Sato (2017). For conciseness, these results are available upon request.

¹⁶ The results remain qualitatively similar when using a less granular definition of hypogamy. Online Appendix Table A-3 reports estimates based on three education categories: high school and below, specialized training above high school level, and university.

¹⁷ See also: Hainmueller and Xu (2013).

¹⁸ The covariates are reweighted to achieve comparability across their first three moments, as documented in Online Appendix Table A-5. For binary covariates, only their first moment is considered, since matching the mean fully determines all higher moments. For further insights on EB see, for example, Chen and Yang (2019), Hetschko et al. (2020), or Potarca and Hook (2023).

Table 3 Relationship between hypogamy and life satisfaction after entropy balancing

	OLS (1)	OProbit (2)
Hypogamy	−0.139*** (0.044)	−0.150*** (0.049)
Observations	25,514	
Individuals	2600	

Notes: this table shows the partial correlation between hypogamy and standardized life satisfaction using entropy balancing weights. The covariates are the same as in the specification (4) of Table 2. Standard errors (clustered at the individual level) in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

ple comprises 41,667 observations for 3811 individuals, with single women coded as non-hypogamous.

Table 4 shows that hypogamy remains negatively associated with life satisfaction in both OLS and fixed-effects models, while marriage itself is positively related to well-being. Online Appendix Table A-6 underlines that hypogamous marriages exhibit only a small and insignificant well-being premium relative to being unmarried. This indicates that the well-being gains from marriage are substantially reduced in hypogamous unions, highlighting the importance of the topic overall and the robustness of the results to the inclusion of fixed effects and unmarried individuals.

Finally, I assess the robustness of the baseline estimates to omitted variable bias using the coefficient stability framework proposed by Oster (2019). While the preceding robustness checks address sorting on observables and time-invariant individual heterogeneity, concerns about residual confounding may remain in the absence of an exogenous source of variation. For instance, pre-determined personality traits could jointly influence partner selection and baseline levels of well-being. The Oster approach quantifies how strong the relationship between unobservables and the out-

Table 4 Relationship between hypogamy and life satisfaction including singles

	OLS (1)	FE (2)
Hypogamy	−0.236*** (0.038)	−0.103* (0.054)
Marriage	0.311*** (0.034)	0.149*** (0.031)
Observations	41,667	41,667
Individuals	3811	3811

Notes: this table shows the partial correlation between hypogamy and standardized life satisfaction when singles are included. The covariates differ from the specification (4) of Table 2 by covariates associated with men being omitted, because they are only available for married women. Therefore, the sample rises to 41,667 observations of 3811 individuals. Standard errors (clustered at the individual level) in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

come would need to be, relative to the observables, to fully explain away the estimated association between hypogamy and women's life satisfaction. This method has been applied in recent studies of subjective well-being and gender-related outcomes, such as Khalil et al. (2024), Grembi et al. (2024), and Graafland and Schilpzand (2025).

An important implementation choice concerns the definition of the relatively "uncontrolled" specification. I define said specification to include education, age, year fixed effects, and prefecture fixed effects, while excluding the other covariates. The framework assumes proportional selection on observables and unobservables and summarizes their relative importance by the parameter δ . Following Oster (2019), I report results under the conservative benchmark $\delta = 1$, which assumes that selection on unobservables is as strong as selection on observables. As emphasized by Oster, this benchmark is strict, since observed controls are typically chosen for their explanatory power, whereas omitted factors are unlikely to be equally influential.

Table 5 reports the results of the Oster (2019) sensitivity analysis for the baseline OLS specification. Column (1) shows the coefficient from the uncontrolled specification including age, year fixed effects, and prefecture fixed effects, while column (2) reports the estimate from the fully controlled model. The stability of the coefficient across these specifications already suggests limited scope for omitted variable bias. Column (3) reports the identified set under alternative assumptions on the relative strength of selection on observables and unobservables. Under the conservative benchmark of equal selection ($\delta = 1$) and setting $R_{max} = 1.3 \times R^2$ of the fully controlled model, the identified set remains strictly negative. This implies that even under demanding assumptions about unobserved confounding, the estimated association between hypogamy and women's life satisfaction does not include zero.

Column (4) reports the value of δ required to drive the bias-adjusted estimate to zero. The implied value of $\delta = 1.303$ indicates that selection on unobservables would have to be stronger than selection on observables to fully explain away the estimated effect. Given that the included controls are chosen precisely for their relevance in explaining both marital sorting and well-being, such a degree of unobserved selection appears highly implausible.

Table 5 Hypogamy and wife's life satisfaction: selection on unobservables

	Coefficient from uncontrolled model (1)	Coefficient from controlled model (2)	Identified set (3)	δ for $\beta = 0$ given R_{max} (4)
OLS				
Hypogamy	−0.248***	−0.137***	[−0.137***, −0.036***]	1.303

Notes: this table shows the validation results for the analysis of the correlation between hypogamy and life satisfaction. Column (1) shows the estimate from the "uncontrolled" model with the wife's age and education, prefecture fixed effects, and year fixed effects as covariates. Column (2) shows the estimate from the controlled model, the same as the estimates in column (4) of Table 2, where all covariates are included in the regression model. The identified set is documented in column (3). The lower bound is the estimate if the proportional degree of selection on unobservables to the selection on observables is 0 ($\delta = 0$), i.e., the coefficient shown in column (2). The upper bound is calculated based on the situation that the selection on unobservables is equal to the selection on observables ($\delta = 1$) and $R_{max} = 1.3(R^2)$, where R^2 is from column (2). Column (4) shows the value of δ which would produce $\beta = 0$ given the value of R_{max} . Standard errors (clustered at the individual level) in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Taken together, the robustness analyses substantially narrow the scope for alternative explanations based on selection and model specification. Reweighting the sample to balance observables using entropy balancing, exploiting within-individual variation through fixed-effects models, and formally assessing residual confounding using coefficient stability bounds all point in the same direction and yield remarkably stable estimates. The entropy-balanced results indicate that observable compositional differences do not drive the baseline association, while the fixed-effects specifications show that the findings are not solely explained by time-invariant individual heterogeneity. Furthermore, the Oster bounds suggest that omitted variables would have to be substantially more strongly related to both hypogamy and life satisfaction than the rich set of included covariates in order to fully eliminate the estimated association. While none of these strategies on their own establishes a causal identification, their consistent implications considerably strengthen the interpretation that the documented relationship reflects a substantive and economically meaningful pattern rather than merely residual selection.

4.3 Heterogeneity by marriage characteristics and education

This section examines whether the association between hypogamy and life satisfaction varies across relationship characteristics. A first dimension is the year of marriage, which serves as a proxy for cohort-specific norms. Individuals who married more recently are less likely to hold traditional gender views (see Online Appendix Table A-7). Also, more female education and a rise in hypogamous marriages can mitigate social pressure from such unions, suggesting that the social meaning of hypogamy may differ across marriage cohorts. I therefore begin by stratifying the sample by marriage-year quartiles.

Table 6 shows the correlation between hypogamy and life satisfaction in different time periods, according to the respective quartiles. The negative association between hypogamy and life satisfaction is strongest among women who married before 1990 and decreases monotonically across later marriage cohorts. This pattern is consistent

Table 6 Hypogamy and life satisfaction: marriage year analysis

	Before 1990 (1)	1990 to 1996 (2)	1997 to 2003 (3)	After 2003 (4)
Hypogamy	−0.215** (0.091)	−0.139* (0.082)	−0.117 (0.077)	−0.048 (0.061)
Observations	7048	6123	5725	5918
Individuals	583	557	542	965

Notes: this table presents the association between hypogamy and life satisfaction across different time periods in which the respondents married. The covariates are the same as in the specification (4) of Table 2. The number of observations is slightly lower than in the main sample of 25,514, as some respondents did not report their marriage year. This question is only asked in the initial questionnaire. For those who married later in the observation period, the marriage year is determined by the year in which the marriage status changes to “married.” Standard errors (clustered at the individual level) in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 7 Hypogamy and life satisfaction: interaction with early marriage

	OLS (1)
Hypogamy	−0.167*** (0.047)
Early marriage (<7y)	0.064* (0.034)
Hypogamy × early marriage	0.107** (0.053)
Observations	24,814
Individuals	2493

Notes: this table presents the association between hypogamy and life satisfaction, including an interaction with early marriage (marriage duration < 7 years). The covariates are the same as in the specification (4) of Table 2. The difference in observations stems from some respondents not indicating their marriage year. Robust standard errors clustered at the individual level are reported in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

with the idea that hypogamy has become less socially unusual in more recent cohorts, thereby reducing the normative pressures against such unions (as stated in Theunis et al. (2018)).

A related dimension is marriage duration. The interaction results in Table 7 indicate that the negative association of hypogamy is reduced in early marriage years.¹⁹ As a substantial share of short-duration marriages stems from earlier cohorts, this pattern is not solely driven by more recent marriage years.²⁰ These results suggest that tensions in hypogamous marriages may intensify over time. One possible interpretation is that the consequences of educational mismatch become more salient as couples progress through later life stages, as the more educated women reach their peak earning and status level capacity.

Tables 6 and 7 jointly indicate that the association between hypogamy and life satisfaction varies systematically across marriage cohorts and marriage duration. I discuss potential life-cycle mechanisms and implications for marital stability in more detail in the Discussion (Sect. 5).

As the educational attainment of women in Japan has constantly risen throughout the last years, the less negative connection between hypogamy and life satisfaction in more recent years may also be supported by women being more educated after 2003 than before 1990, therefore shifting the average education of hypogamous respondents to a higher level.²¹ I therefore next examine heterogeneity by women's educational attainment.

Table 8 shows that hypogamy is negatively associated with life satisfaction, with the strongest negative effect among women with a high school degree or less. The

¹⁹ The results hold when interacting with fewer than 6 years of marriage.

²⁰ Over 40% of marriages younger than 7 years are from 2003 or earlier.

²¹ For those married before 1990, the mean in educational attainment based on the seven categories provided in the JPSC was 3.71, followed by 3.89 until 1996, 4.09 until 2003 and 4.49 afterwards.

Table 8 Hypogamy and life satisfaction: interaction with education level

	OLS (1)
Hypogamy	−0.238*** (0.081)
Vocational × Hypogamy	0.122 (0.098)
University × Hypogamy	0.178* (0.106)
Observations	25,514
Individual	2600

Notes: this table presents how the relationship between hypogamy and life satisfaction differs across education levels. A highest degree of high school or below functions as the baseline category. The covariates are the same as in the specification (4) of Table 2. Standard errors (clustered at the individual level) in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

interaction terms indicate that higher levels of education can mitigate the negative association between hypogamy and life satisfaction. While the interaction term for women with a vocational school degree is positive but statistically insignificant, the interaction term for women with a university degree is larger in magnitude and statistically significant. This pattern is consistent with the idea that higher education may equip women with greater resources that help them navigate potential norm-related frictions within hypogamous unions. I next turn to the magnitude of the educational gap between spouses (Table 9). Instead of a binary hypogamy indicator, I use a measure of educational distance, where positive values indicate a female educational advantage.

The table shows that the magnitude of the distance in educational attainment may also play an essential role in the negative correlation between hypogamy and life

Table 9 Hypogamy and life satisfaction: magnitude of educational difference

	Complete sample (1)	Female advantage (2)	Male advantage (3)
Educational distance	−0.047*** (0.013)	−0.088** (0.042)	0.004 (0.039)
Observations	25,514	6929	8409
Individuals	2600	694	880

Notes: this table shows the association between educational distance and life satisfaction. Educational distance is defined as the wife's educational attainment minus her husband's attainment, based on the seven-category JPSC scale. The measure, therefore, theoretically could include values from −6 to +6, whereas the sample ranges from −6 (wife: Junior High School; husband: Graduate School) to +5 (wife: University; husband: Junior High School). Column (1) uses the full sample. Column (2) restricts the sample to couples in which the wife has a higher education than her husband. Column (3) restricts the sample to couples in which the husband has a higher education than the wife. The covariates are the same as in specification (4) of Table 2. Standard errors clustered at the individual level are reported in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

satisfaction, a result that is in line with Ma and Piao (2019). As long as the male has at least the same or higher education, raising the distance of education to the female does not yield a significant effect. The significantly negative effect is only apparent if women have a higher education than their husbands.

This subsection documents several key findings. More recent marriage cohorts, as well as marriages of shorter duration, are not, or are not as strongly, negatively associated with life satisfaction as earlier cohorts and longer-lasting marriages. Further heterogeneity analyses indicate positive well-being implications of higher educational attainment per se, while also showing that a larger educational gap is negatively associated with life satisfaction when it favors the wife. Importantly, the findings suggest that higher educational attainment remains beneficial for women, but that status-related dynamics within the couple may become more pronounced when the wife holds a stronger educational advantage. I now turn to direct measures of traditional gender attitudes before linking these to intra-household mechanisms.²²

4.4 Traditional attitudes

Hypogamy may be more consequential for women whose own expectations favor a traditional division of labor. A wife's educational advantage may suggest a stronger labor market attachment and a departure from the specialization model in Becker (1973), which may reduce well-being for women who prefer household specialization. For women with more egalitarian expectations, hypogamy may instead align more closely with preferred roles and be less detrimental. On the other hand, social identity considerations may generate utility losses when women occupy roles that conflict with societal norms (Akerlof and Kranton 2000). This subsection, therefore, examines whether traditional gender-role attitudes moderate the association between hypogamy and life satisfaction.

Heterogeneity by traditional gender-role attitudes is measured by using two survey items on male breadwinning and maternal employment. The statements used to construct the traditional-attitudes measure are "Men should work outside the home, and women should work at home," and "Mothers should not have jobs and focus on childcare until their children are about three years old." In Panel A of Table 10 and in the rest of the paper, I classify respondents as traditional if they (somewhat) agree with both statements and as non-traditional if they (somewhat) disagree with both. Respondents with mixed responses are excluded to focus on clearly defined attitude groups. These measures capture women's own views on gender roles, rather than external social pressure or the husband's expectations. As questions on attitudes have only been asked from 2011 onward, Panel A is based on 8373 observations. Panel B extends the analysis of this sub-section by imputing missing values using birth-year and prefectural averages of traditional responses (using birth-year averages only when prefecture-level cells are unavailable). I then classify respondents as traditional or non-traditional by applying a ± 2.5 percentage-point band around the 50% thresh-

²² Apart from the findings presented in this subsection, differences between full-time and part-time employed respondents were investigated. The results do not show qualitative differences and are available upon request.

Table 10 Hypogamy and life satisfaction: traditional attitudes

	Both groups (1)	Traditional (2)	Non-traditional (3)
Panel (A): Non-imputed			
Hypogamy	−0.163*** (0.050)	−0.254*** (0.072)	−0.098 (0.065)
Observations	8373	3904	4469
Individuals	1739	1023	1133
Panel (B): Imputed			
Hypogamy	−0.116*** (0.041)	−0.190*** (0.058)	−0.073 (0.052)
Observations	21,906	10,410	11,496
Individuals	2380	1456	1660

Notes: this table shows the heterogeneous association between hypogamy and life satisfaction by traditional views. The covariates are the same as in the specification (4) of Table 2. As the questions related to traditional attitudes have only been asked since 2011, the sample decreases to 8373 observations in *Panel A*. The imputed panel uses the same sample definition as *Panel A* and assigns values to observations with missing traditional-status information. Specifically, I impute missing traditional values using the mean response by birth year and prefecture, or, when this cell mean is unavailable, I only use the birth-year mean instead. In the imputed panel, I classify the traditional status of respondents by their predicted traditional share outside a ± 2.5 percentage-point band around 50% to exclude the most ambiguous views. Standard errors (clustered at the individual level) in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

old, excluding those with the most ambiguous views. Therefore, Panel B shifts the interpretation of traditional attitudes from individual beliefs toward a broader societal norm perspective.

Table 10 reveals a clear pattern that is consistent with the hypothesis that among women who hold expectations of a traditional household arrangement, hypogamy is strongly and statistically significantly associated with lower life satisfaction. This is consistent with expectations of a traditional division of labor, as the educational imbalance may raise expectations and generate additional friction when hypogamy suggests a deviation from a primary role in home production. By contrast, for hypogamous women who do not align with traditional role expectations, no negative association is observed. In this group, the positive implications of hypogamy for a non-traditional household setting may offset any potential negative effects of broader role expectations as discussed in Akerlof and Kranton (2000). The results are robust across both the imputed and non-imputed samples.

To further strengthen robustness beyond self-reported measures of traditional attitudes, I approximate traditional attitudes by focusing on couples in which the wife is older than her husband. Trimarchi (2022) shows that gender-egalitarian men and women are more likely to form relationships in which the wife is older than the husband. Accordingly, I estimate the effects for women whose husbands are younger than they are to proxy a less traditional group, relative to potentially more traditional women.

Table 11 shows that women are not significantly negatively affected by being in a hypogamous relationship if they are older than their husbands. In the more common

Table 11 Hypogamy and life satisfaction: age differences

	Full sample (1)	Woman same age or younger (2)	Woman older (3)
Hypogamy	−0.137*** (0.039)	−0.143*** (0.044)	−0.094 (0.080)
Observations	25,514	20,791	4723
Individuals	2505	2133	493

Notes: this table shows the heterogeneous association between hypogamy and life satisfaction by age difference with the husband. The covariates are the same as in the specification (4) of Table 2. Standard errors (clustered at the individual level) in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

situation of having a male partner of the same or an older age, hypogamy is significantly negatively correlated with life satisfaction. This pattern is consistent with the interpretation that hypogamy is less detrimental in relationships that are plausibly more gender-egalitarian, which suggests both partners being more open to violate gender norms in favor of efficient market work and home production allocations.

In summary, these results provide complementary support for the role of gender norms in moderating the well-being implications of hypogamy. Whether considering wives' attitudes directly, extending these to societal norm averages, or focusing on plausibly more egalitarian couples, the results consistently point toward hypogamy's negative implications in more traditional settings. The next section examines how differences in time-use and financial arrangements among traditional norms shape the association between hypogamy and life satisfaction.

4.5 Time sharing and financial channels among traditional attitudes

I now turn to examining potential channels underlying the negative association between hypogamy and life satisfaction. A large body of literature documents adverse well-being effects when women challenge traditional male dominance in labor market outcomes, as described in Sect. 2.1. Building on the finding that the negative association is concentrated among traditionally oriented women, I analyze whether hypogamous women's well-being responds differently to relative allocations of time and financial resources within the household and focus on market work, housework (including childcare), leisure, income, and expenditures. These variables closely follow Lise and Yamada (2018) and provide indirect evidence on how educational imbalances translate into observable household arrangements and how these arrangements relate to well-being.

Negative well-being associations can stem from differences in expectations among several actors. First, societal pressures may arise when hypogamous couples deviate from traditional specialization. Where the male breadwinner model remains common, a high female market work or income share can signal a role reversal and intensify the negative association between hypogamy and life satisfaction through societal pushback. Second, partner responses may operate through the allocation of time and resources within the household. If husbands react negatively to educational imbalances, this may manifest in limited support in housework or childcare, less shared

leisure, or unequal spending, thereby reinforcing the double burden faced by hypogamous women with stronger labor market involvement. Third, internalized expectations may shape how women evaluate identical household allocations, even absent external pressure. For traditionally oriented women, high market work or income shares may conflict with preferred gender identities and generate psychological costs, especially among raised expectations through more educational achievements. In contrast, non-traditional women may experience dissatisfaction when they are constrained to perform a large share of housework despite having higher education and labor market potential. By interacting hypogamy and household shares with traditional gender attitudes, I assess the existence and magnitude of related well-being implications.

The allocation of income, working hours, or related factors is typically evaluated at the 50% threshold to capture differences between men and women. While focusing on the cutoff that reverses the household leader in a given category is conceptually sound, the Japanese sample contains several measures in which women only rarely surpass men's production. This reflects predominantly traditional household settings and implies an adjustment of the threshold. I therefore use the 75th percentile as the cutoff for a high share in the interaction analyses. Figure 2 presents the distributions of time use and financial shares within couples, separately for hypogamous and non-hypogamous women, highlighting the strong skewness of several allocations. Corresponding summary statistics are reported in Online Appendix Table A-8.

Panels (a) to (c) describe time use on work days. Female market work shares are generally well below those of their husbands, and cases in which women approach or

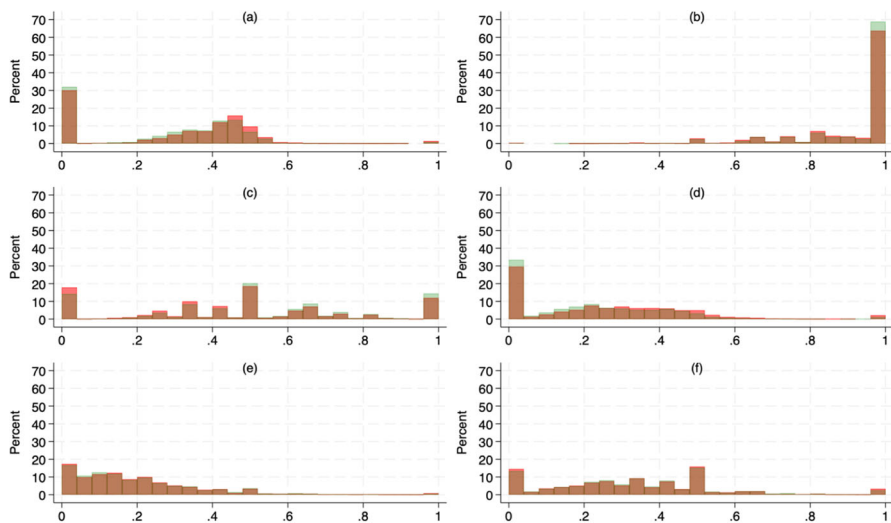


Fig. 2 Distribution of time use and financial shares. Notes: this figure shows the distribution of time use and financial shares within the household. **a** Market work share $\frac{w_w}{w_w + w_h}$ (mean: 0.278, s.e.: 0.001), **b** housework share $\frac{h_w}{h_w + h_h}$ (mean: 0.919, s.e.: 0.001), **c** leisure share $\frac{l_w}{l_w + l_h}$ (mean: 0.495, s.e.: 0.002), **d** income share $\frac{i_w}{i_w + i_h}$ (mean: 0.216, s.e.: 0.001), **e** expenditure share within family $\frac{\exp HH_w}{\exp HH_w + \exp HH_{r, est}}$ (mean: 0.191, s.e.: 0.001), and **f** expenditure share wife/spouse $\frac{\exp HH_w}{\exp HH_w + \exp HH_h}$ (mean: 0.326, s.e.: 0.002)

exceed parity remain rare, though slightly more common among hypogamous women. Housework, by contrast, is highly concentrated among all women, with a large mass at full responsibility. Given this extreme skewness, I distinguish between women who perform all housework and those who do not in the empirical analysis. Leisure is the most evenly distributed time-use measure, shows substantial overlap across groups, but also indicates that hypogamous women on average enjoy less leisure than non-hypogamous women. Panels (d) to (f) display financial shares. Hypogamous women exhibit somewhat higher income shares, yet cases in which women outearn their husbands are uncommon. The expenditure shares show no significant differences for hypogamous and non-hypogamous women. The direct comparison with the husband shows clustering around equal splits for all women.

Table 12 shows how the time shares relate to the correlation between hypogamy and life satisfaction. The first column shows the main correlation, including all controls but with an adjusted sample so that none of the extra time share variables have missing values.²³ In the next columns, dummy variables indicate a high share of female production within a certain category. As indicated before, “high” refers to the 75th percentile.²⁴ The even-numbered columns add the respective time share variables and their interactions with hypogamy, while the subsequent columns additionally account for traditional attitudes and the corresponding interaction terms. After their first introduction, the rows are titled in abbreviated form.

A high market work share does not show any significant influence on life satisfaction (column (2)). Once traditional norms are introduced, the coefficient on hypogamy, which now captures women with comparatively non-traditional attitudes, becomes insignificant. In contrast, traditional hypogamous women with a high market work share exhibit a strong negative association with life satisfaction. The interaction term between a high market work share and hypogamy turns positive, but remains statistically insignificant. This pattern is most consistent with an internalized expectations channel. For traditionally oriented women, a comparatively large market work share may conflict with preferred gender roles and reduce well-being, whereas no such penalty emerges for non-traditional hypogamous women. Raised expectations through more educational achievements may strengthen the negative association for hypogamous women.

Shouldering the entire housework load is significantly negatively correlated with life satisfaction, and the coefficient on hypogamy declines by around 25% once this variable is included. The interaction between hypogamy and full housework responsibility is not statistically significant. The positive, though insignificant, interaction with traditional attitudes suggests that taking over all housework may be less detrimental for women whose internalized norms align with a traditional division of labor. At the same time, average differences in housework shares between hypogamous and non-hypogamous women are small and occur at already very high levels of female responsibility (see Online Appendix Table A-8 for exact values). Women taking over

²³ Online Appendix Tables A-9 and A-10 show the table with constant observations among all specifications. In the main text, the observations in the even-numbered columns are capped only by missing values in the share-variables to maintain the highest predictive power possible.

²⁴ For the market work share, that means at least 44.44% of market work is done by the woman to be in the high category, for leisure it amounts to 66.67%, while for housework, full responsibility is regarded.

Table 12 Hypogamy, life satisfaction, and traditional norms: time shares

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Hypogamy	−0.120*** (0.040)	−0.101** (0.043)	−0.093 (0.074)	−0.086* (0.050)	−0.023 (0.076)	−0.145*** (0.041)	−0.092 (0.064)
Traditional			−0.007 (0.046)		−0.086 (0.064)		−0.031 (0.047)
Hypogamy × Traditional			−0.081 (0.100)		−0.194 (0.122)		−0.154* (0.093)
High market work share		0.028 (0.039)	0.020 (0.061)				
Hypogamy × High work		−0.070 (0.071)	0.078 (0.100)				
High work × Traditional			−0.010 (0.088)				
Hypo × Work × Trad			−0.422** (0.175)				
Full housework				−0.098*** (0.033)	−0.124** (0.057)		
Hypogamy × Housework				−0.051 (0.054)	−0.061 (0.091)		
Housework × Traditional					0.109 (0.074)		
Hypo × House × Trad					0.020 (0.140)		
High leisure share						0.013 (0.027)	−0.028 (0.050)
Hypogamy × Leisure						0.120* (0.066)	0.211* (0.112)
Leisure × Traditional							0.076 (0.067)
Hypo × Leisure × Trad							−0.203 (0.164)
Observations	21,575	21,575	7031	21,575	7031	21,575	7031
Individuals	2500	2500	1641	2500	1641	2500	1641

Notes: this table shows the association between hypogamy and life satisfaction. I add several interactions with high intra-household time shares, as well as the interaction with traditional social norms. The covariates are the same as in the specification (4) of Table 2. Standard errors (clustered at the individual level) in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

nearly all housework duties is consistent with persistent societal expectations toward wives' domestic roles, irrespective of education, and limits the explanatory power of partner-level adjustments in this specification.

A high leisure share is not significantly associated with life satisfaction among non-hypogamous women. Once leisure is accounted for, the hypogamy coefficient becomes more negative, implying that hypogamous women without a relatively high

leisure share experience particularly low well-being. In contrast, for hypogamous women with a high leisure share, the interaction term turns positive. When educational differences translate into greater leisure, they may fulfill expectations of a return to education and thereby mitigate norm-related strain.

Table 13 examines how three financial indicators relate to the association between hypogamy and life satisfaction: A high-income share relative to the husband, a high

Table 13 Hypogamy, life satisfaction, and traditional norms: financial shares

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Hypogamy	−0.124*** (0.041)	−0.143*** (0.045)	−0.153* (0.079)	−0.157*** (0.044)	−0.161** (0.074)	−0.124*** (0.041)	−0.079 (0.068)
Traditional			0.003 (0.046)		−0.027 (0.047)		−0.012 (0.044)
Hypogamy × Traditional			−0.063 (0.102)		−0.070 (0.099)		−0.150 (0.093)
High income share		−0.019 (0.046)	−0.031 (0.068)				
Hypogamy × High income		0.072 (0.067)	0.195* (0.105)				
High income × Traditional			−0.152* (0.092)				
Hypo × Income × Trad			−0.221 (0.175)				
High family expense share				0.039 (0.027)	−0.004 (0.049)		
Hypogamy × Family expense				0.127** (0.052)	0.257*** (0.096)		
Family expense × Traditional					0.017 (0.069)		
Hypo × Family exp × Trad					−0.255* (0.151)		
High spousal expense share						−0.038 (0.037)	−0.015 (0.059)
Hypogamy × Spousal expense						−0.002 (0.072)	0.045 (0.108)
Spousal exp × Traditional							−0.051 (0.087)
Hypo × Spousal exp × Trad							−0.047 (0.171)
Observations	21,621	21,621	6984	21,621	6984	21,621	6984
Individuals	2492	2492	1620	2492	1620	2492	1620

Notes: this table shows the association between hypogamy and life satisfaction. I add several interactions with high intra-household financial shares, as well as the interaction with traditional social norms. The covariates are the same as in the specification (4) of Table 2. Standard errors (clustered at the individual level) in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

expenditure share within the household, and a high expenditure share relative to the husband.²⁵

Having a high-income share shows a positive association for hypogamous women, while it is negatively correlated for non-hypogamous women (both at non-significant levels, column (2)). Once traditional norms are introduced (column (3)), hypogamy is significantly positively correlated with life satisfaction in the interaction with high income, which captures those with non-traditional attitudes. Women with traditional attitudes show a negative correlation with a high-income share. This is consistent with the internalized expectations channel. Higher earnings may enhance well-being when they align with egalitarian preferences, but they can generate tension when conflicting with traditional role beliefs.

Women who make up a larger part of the expenditure compared to the entire family show a positive and significant association with life satisfaction only in the interaction term with hypogamy. The effect is even stronger once the interaction between hypogamy and family expenses provides information on non-traditional women (column (5)). Here, the opposite can be regarded for traditionally thinking wives. The higher share of expenses could be in line with high bargaining power and a potentially raised position within the household for hypogamous women. The direct relation to the husband's expenses (columns (6, 7)), also shows a positive correlation in the interaction term for non-traditional hypogamous women, though not statistically significant.

Overall, the financial results point toward bargaining power and the status in the household as a relevant mechanism. Hypogamy is not uniformly detrimental, but appears to be less negatively associated with life satisfaction when educational advantages translate into tangible financial influence within the household, particularly among women whose attitudes are consistent with less traditional gender roles.

This sub-section examined how relative allocations within the household shape the association between hypogamy and life satisfaction. While the average correlation is negative, the results show substantial heterogeneity across channels. Among traditionally oriented women, hypogamy is negatively associated with life satisfaction when it coincides with a high market work share. In contrast, hypogamous women with higher leisure, income, or expenditure shares experience higher well-being when they do not hold traditional attitudes, consistent with greater bargaining power and realized returns to education. Overall, the evidence suggests that lower life satisfaction among hypogamous women is not driven by educational differences alone, but by a mismatch between educational attainment and status within the household.

5 Discussion

This paper documents a robust negative association between educational hypogamy and women's life satisfaction in Japan, with pronounced heterogeneity by traditional

²⁵ A high-income share: 36.36 % compared to the husband. A high share of expenditures within the family: 25% by the wife compared to the whole household. A high expenditure share compared to the husband: 50%. The female expenditure share, when compared to the husband, includes a larger group at 50%, which leads to not 25%, but 12.02% of females being included in the high expense sub-group.

attitudes and marriage duration. While the findings are stable across specifications, several limitations merit consideration.

First, the analysis is limited to women's self-reported life satisfaction. The Japanese Panel Survey of Consumers does not collect subjective well-being information for husbands, which precludes direct comparisons between male and female responses. Consequently, it is not possible to assess whether husbands experience parallel, offsetting, or opposing well-being effects in hypogamous marriages.

Second, the data does not fully capture intangible or unobserved contributions within marriages. Forms of support, such as emotional assistance or social resources, may differ across couples but are not directly observable. If such factors systematically vary by educational matching, the estimated associations may not reflect all dimensions of marital interaction.

Third, the results should be interpreted in a context in which assortative mating and homogamous marriages remain the dominant norm. Hypogamous marriages have become more frequent with rising female education, reflecting broader changes in educational attainment and partnership patterns observed across developed economies over recent decades. These developments are consistent with generational shifts in gender-role attitudes and may also be influenced by increased global connectedness, which facilitates exposure to more progressive ideas even in traditionally oriented societies. However, hypogamy still constitutes a deviation from prevailing expectations. The documented association, therefore, reflects outcomes within a social environment where homogamy remains the reference point.

Fourth, an additional interpretation of the negative results in later marriage years relates to life-cycle dynamics. The consequences of hypogamy may not be immediate but may emerge as women approach peak earning capacity or higher professional status later in life. In early marriage years, differences in educational attainment may not yet translate into substantial income or status differentials. As careers develop and household roles solidify, these differences may become more salient, potentially intensifying tensions related to deviations from traditional status hierarchies. While the available data do not allow a direct test of career-stage mechanisms, the observed pattern of weaker associations in early marriage years and stronger associations thereafter is consistent with such a dynamic process.

Finally, and in line with the previous point, marital stability may affect the estimates. If hypogamous marriages are more likely to dissolve as lower life satisfaction increases separation risks, long-lasting marriages may selectively exclude the least satisfied individuals. The negative well-being association of hypogamy may therefore be understated.

6 Conclusion

This paper analyzes the association between educational hypogamy and women's life satisfaction and the role of traditional household norms in Japan using longitudinal data from the Japanese Panel Survey of Consumers from 1993 to 2020.

Hypogamy is robustly associated with lower life satisfaction. The association is heterogeneous, and women who married in more recent years show no negative corre-

lation between hypogamy and life satisfaction, a pattern that is consistent with broader societal changes among rising female educational attainment and an increasing prevalence of hypogamous marriages. Yet, in line with the generally beneficial nature of more educational achievements, women with a university education exhibit a somewhat weaker negative association. Following previous literature, educational distance is negatively correlated with life satisfaction only when the wife is more educated than her husband.

Distinguishing between traditional and non-traditional gender attitudes reveals a central role of norms. Hypogamy is negatively associated with life satisfaction among women with traditional attitudes in general, while no such association is observed for non-traditional women. Examining potential channels, the analysis reveals that hypogamy accentuates role-expectations. Traditionally oriented hypogamous women show more negative associations with life satisfaction than non-hypogamous women when they are more involved in market work. Conversely, non-traditionally oriented hypogamous women with higher income, expenditure, or leisure shares have more positive satisfaction outcomes.

Promoting less strictly gendered household norms is an important policy implication of this paper. Traditional expectations are associated with negative well-being for a rising share of women in hypogamous relationships, while those inclined to provide more market work among non-traditional views have to overcome a strongly gendered housework burden irrespective of educational background. While this paper does find evidence for a recent relaxation of the negative association, Japan, and other countries facing demographic challenges, may be inclined to accompany gendered educational shifts and labor market demands by facilitating more equal divisions of housework in marriages among negligible fertility outside of wedlock.

Overall, the paper contributes to the literature on family economics and well-being by highlighting the association between educational hypogamy and life satisfaction and the role of traditional norms. Future research could extend this analysis by examining men's well-being, incorporating both partners' attitudes, and studying the role of hypogamy in marriage formation and dissolution.

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Data availability The Japanese Panel Survey of Consumers (JPSC) is provided by the Panel Data Research Center, Institute for Economic Studies, Keio University (PDRC). Detailed information about the dataset can be found here: <https://jpsc-codebook.readthedocs.io/en/latest/index.html> and access can be applied for on the official website of the PDRC: <https://www.pdrc.keio.ac.jp/pdrc/en/>. The World Values Survey data used for Fig. A-1 in the Online Appendix is openly available at www.worldvaluessurvey.org.

Declarations

Conflict of interest The author declares no competing interests.

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