

ORIGINAL ARTICLE

Is one's happiness associated with their spouse's income, and vice versa? Insights from China

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Abstract

Objective: This study empirically explores the relationship between spousal income and individual happiness in contemporary China.

Methods: Utilizing three waves of the Chinese General Social Survey (CGSS) data set, we employ a methodological approach involving an ordinal logit model, nearest neighbor matching, inverse probability weighting methods, and a series of robustness tests.

Results: The findings reveal an asymmetric association between spousal income and one's happiness within the family context. Husband's happiness is more positively linked to his own income than his wife's income, whereas the wife's happiness is positively associated with her husband's income rather than her own. This association is more pronounced for women from rural areas and lower-income households, influenced by traditional gender ideologies and limited economic and political participation.

Conclusion: Our results highlight that women in contemporary China, especially those in rural areas and from lower-income households, continue to rely on the traditional gender role arrangement for greater well-being, emphasizing the enduring influence of spousal income on women's happiness.

KEYWORDS

Chinese General Social Survey, economic and political participation, gender ideologies, husband's income, wife's happiness

The pursuit of gender equality is a long-standing theme in the quest for social justice and equality, serving as a barometer of social progress and civilization. In contemporary China, women have made significant strides in social and economic advancements as a result of economic reforms (Yang 2020). In the face of rapid urbanization and industrialization, many women have entered the labor market to compete with men in various industries, including entrepreneurship (Cooke and Xiao 2021). Additionally, as women's

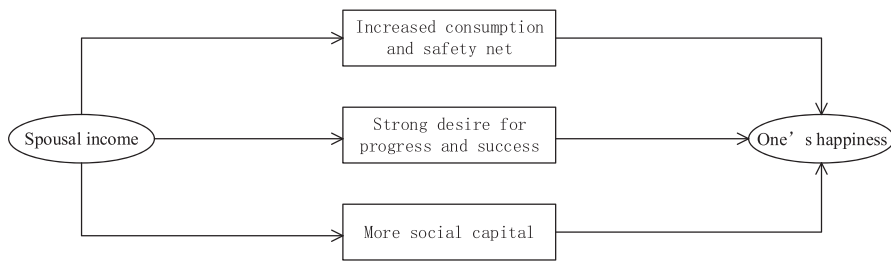


FIGURE 1 Conceptual framework.

education has expanded¹, they have increasingly gained entry into emerging high-tech sectors such as e-commerce, telecommunications, and biological sciences (Liu et al. 2022). These advancements as a driving force have contributed to women's greater economic and psychological independence, enabling them to rely more on themselves to pursue their own happiness rather than depending solely on men.

Despite the strides made toward gender equality in China, traditional gender ideologies as a resisting force continue to exert a significant influence on contemporary Chinese society (Leung 2003; Yu and Xie 2021). According to these traditional beliefs, men are expected to provide for the family financially, while women are expected to take care of the home and children (Attané 2013). This gendered division of labor often results in women relying heavily on their husbands, who have the primary responsibility of providing for the family's livelihood (Wang, Li, and Feng 2019). As a result, a woman's well-being often depends on her husband's achievements outside of the home. Consequently, women in China often seek to marry men from a higher socioeconomic background to improve their own family's status.

Although there are two competing external forces influencing women's well-being, no research has been conducted to determine which force has played a leading role in shaping contemporary Chinese women's well-being. Against the backdrop of China's developments in recent decades, this study aims to investigate whether the dependence of women's well-being on their husbands for happiness has decreased with socioeconomic advancements, using data from three waves of Chinese General Social Survey (CGSS). While utilizing causal inference methods, the results suggest that a husband's happiness is only weakly, or even not at all, associated with his wife's income. Conversely, a wife's happiness demonstrates a positive correlation with her husband's income, particularly notable among women with a lower socioeconomic status. These findings illuminate the persistence of traditional gender ideologies as the prevailing influence in China.

The contribution of the study can be summarized as follows. First, we contribute to the literature on determinants of personal happiness within the family context. It is found that family-level factors, for example, family members' identities, characteristics, and behaviors, can influence one's happiness due to spillover effects within the family (Chen 2018; Wang, Cheng, and Smyth 2019). For example, it is found that a wife's intrahousehold bargaining power is negatively associated with her happiness and marital satisfaction in Japan (Ma and Piao 2019). Regarding our topic, most studies have focused on the effect of relative income of couples on their marital satisfaction but obtained inconsistent results (Bertrand et al. 2015; Eirich and Robinson 2017; Rogers and DeBoer 2001; Zhang and Tsang 2013). Moreover, most studies have been contextualized in Western societies. In contrast, there have been limited studies discussing the relationship between spousal income and one's overall happiness, especially in developing and transitioning societies. The Chinese context is ideal for this study as it presents a unique experiment-like scenario with two opposing forces that could shed new light on the determinants of happiness.

Secondly, while not empirically verified in the paper, we try to offer a practical conceptual framework to analyze the relationship between spousal income and one's happiness. This framework in Figure 1 strength-

¹ In 2020, the proportion of undergraduate and junior college female students in China was 51% and 58%, respectively, and the proportion of postgraduate female students also exceeded that of men, reaching 50.9%.

ens the analysis and provides possible insights for future research to explore spillover effects within the family. Specifically, we propose that increased spousal income can lead to improved well-being of all family members due to increased consumption expenditure on goods and services (Tambyah and Tan 2022; Wang, Li, and Feng 2019), as well as the provision of a safety net against future uncertainties (Easterlin 2021; Nordheim and Martinussen 2020). In addition, high income is often associated with a strong desire for progress and success in society (Hopcroft 2021), which is valued by spouses in marriage, and can directly enhance spousal happiness (Wang, Cheng, and Smyth 2019). Moreover, increased income can provide more social capital centered on networking and mutual trust, which can be transformed into other types of social resources (Inkeles 2001). This can bring convenience to the study and work of family members, reducing negative effects caused by adversity (Furstenberg 2005). Therefore, if the spouse has more income, an individual's social capital also increases, contributing to a sense of well-being.

Thirdly, by employing a series of econometric techniques for causal inference, the robust findings derived from the largest developing country could guide other developing countries with patriarchal traditions in formulating policies to enhance women's capabilities and well-being. The study suggests that socioeconomic advancements alone cannot eradicate the societal norms of female reliance on their spouses, particularly among underprivileged women. So, to eliminate such unilateral happiness dependency, we must further provide equal opportunities for access to economic and political affairs for both women and men. This type of socioeconomic development is not men-centered but based on the expansion of women's agency and capability by giving them more opportunities.

The rest of the study proceeds as follows. The second section provides a literature review and outlines the research hypotheses. The third section explains data source, variables, and descriptive statistics. The fourth section shows econometric analysis and interpretation of the results, and the last section discusses and concludes the study.

LITERATURE REVIEW AND RESEARCH HYPOTHESIS

The transition from a planned economy to a market economy in China has provided women with numerous economic opportunities for self-development in various areas (Gaetano 2018; Matthews and Nee 2000). This shift has challenged the traditional idea of male superiority over women, and has contributed to an increase in women's awareness of self-independence (Yang 2020). Nevertheless, the tendency of women to rely on their husbands for higher well-being has not been fully eradicated, due to various visible and invisible constraints stemming from deep-rooted patriarchal social norms² (Wang, Cheng, and Smyth 2019; Yu and Xie 2021).

As a result, women are often expected to "marry up" in the marriage market, with husbands typically having higher educational, socioeconomic, and income backgrounds than their wives (Qian and Qian 2017). In recent years, many women have come to believe that marrying well is more important than achieving financial independence (Chen 2018), with men who own houses and cars being particularly desirable to prospective wives (Wang, Cheng, and Smyth 2019). On the other hand, men who marry women with advantages in many areas may be seen as "living off a woman," as societal norms dictate that husbands should be the primary supporters of their families (Xiao and Asadullah 2020).

Therefore, it is commonly observed that women improve their well-being by marrying up, which often involves placing their well-being in the hands of their husbands (Chen 2018; Qian and Qian 2017). In cases where women are disadvantaged, marrying men with higher educational and socioeconomic status can significantly enhance their subjective well-being (Xu et al. 2000). Despite potential social stigma, such as being labeled "leftover women" (Ji 2015; To 2013), women tend to maintain their high standards in the marriage market and continue to wait for satisfactory partners. However, unlike women, men seldom improve their socioeconomic status through marriage, instead relying on their own efforts to improve per-

² These norms often emphasize male dominance, defining gender roles that assign specific responsibilities and privileges to men while prescribing subordinate roles for women.

sonal well-being. The phenomenon of leftover men is more likely to occur in families with poor social and economic conditions (Chowdhury 2014). In light of these observations, we propose the first hypothesis, which suggests that patriarchal traditions remain prevalent despite a century of progress.

H1: There exists an asymmetrical association between spousal income and individual happiness, characterized by a positive correlation between a wife's happiness and her husband's income, whereas the association between a husband's happiness and his wife's income is weak, if not entirely absent.

Despite significant advancements, true equality between men and women remains elusive in China, with men retaining dominance in various important spheres (WEF 2021). In a male-centric society, women face numerous challenges in terms of political and economic participation, especially at high levels of participation. Although women have the right to vote and be elected, their presence in important political affairs is relatively low (Guo et al. 2009; Yang 2020). When participating in political domains, women's positions tend to be concentrated in less important fields such as education, culture, and sports. Moreover, women tend to hold more deputy positions, and the proportion of high-level women in the entire political system is small (Wang and Dai 2013).

Similarly, although women are granted equal opportunities for work by law, they face increasing discrimination in the labor market (Zhang et al. 2021). Employers may set discriminatory recruitment conditions for women during job applications, and women may be implicitly demoted or even dismissed during pregnancy, childbirth, and breastfeeding, despite laws prohibiting such violations (Leung 2003). In the current environment, additional constraints such as the three-child policy have further increased discrimination against women in the labor market (Wu 2022). Women are also underrepresented in high-level management teams, particularly in state-owned companies due to the glass ceiling effect (Gao et al. 2016). As a result, women's labor income is significantly lower than that of men in the economy, and the gender wage gap is widening (Iwasaki and Ma 2020). All these factors contribute to women remaining dependent on their male counterparts for higher well-being.

These constraints are even greater for socioeconomically disadvantaged women, such as those from rural areas, and households with lower incomes, who have limited bargaining power over their gender roles within their families. Such women face greater difficulties in participating in basic economic and political activities, and they are nearly absent from top-level positions due to personal beliefs and external adverse conditions (Judd 1990; Liu 2013). Consequently, socioeconomically backward women are less likely to participate in economic and political affairs; instead, they are inclined to hold the belief that women should rely on their husbands for better livelihood. This reinforces these women's tendency to depend on their husbands for higher well-being. In light of this, we propose the second hypothesis.

H2: For women from socioeconomically disadvantaged backgrounds, such as those from rural areas, and households with lower income, their level of happiness is strongly linked to their husbands' income, primarily due to their limited opportunities for political and economic participation and the prevalence of traditional gender ideologies.

DATA, SAMPLE, VARIABLES, AND DESCRIPTIVE STATISTICS

Data source

This study employs three waves of the CGSS data for econometric analysis. The CGSS, initiated in 2003, is a nationally representative, comprehensive, and continuous academic survey in China. It collects socioeconomic and demographic information at the community, family, and individual levels and has been widely used in contemporary Chinese sociology and economic research. The CGSS data set is particularly suitable for our study, as it contains rich information on individuals' well-being, income, their spouse's income and well-being, and other individual and family-level characteristics. The CGSS 2017 is the latest publicly

available survey wave. We combine the CGSS 2013, 2015, and 2017 to form a repeated cross-sectional data set to increase the sample size³. This could improve the precision of estimators, particularly for subgroup regressions that analyze possible heterogeneous effects. After addressing missing values and outliers in key variables, we have a dataset of 21,531 observations ready for empirical analysis, comprising 11,050 females and 10,481 males.

Variable selection

The explained variable in this study is self-reported happiness (*Happiness*), which is measured by the question: “overall, are you feeling happy?” Respondents are given five options: “very unhappy,” “relatively unhappy,” “unhappy,” “relatively happy,” and “very happy.” However, given that only 1.57 percent of respondents reported feeling “very unhappy,” we merge this category to “relatively unhappy.” Thus, we obtain a new happiness variable with values ranging from 1 to 4, with a higher score indicating a greater level of happiness.

The core explanatory variable in this study is the spouse's income (*Spouse_income*), which is measured by the question: “what is your spouse's annual income?” We neutralize the impact of inflation by establishing 2012 as the reference year. The formula for real income in 2013 is derived as the nominal income in 2013 divided by $(1 + \text{inflation rate})$, and this methodology is applied similarly for 2015 and 2017. To account for the impact of outliers, we use the logarithmic form of income in the regression equation⁴.

To remove confounding effects, this study controls for a rich set of potential confounding factors. They include individual-related factors such as Han ethnicity (*Han_ethnicity*), household registration (*Urban_hukou*), religious belief (*Religious_belief*), the Chinese Communist Party (CCP) membership (*CCP_member*), educational level (*Education*), the perception on social equity (*Social_equity*), the frequency of social interactions at free time (*Social_interaction*), and age (*Age*). Additionally, we control for age square (*Age_square*), given numerous studies reveal a U-shaped relationship that suggests a decline in happiness during early adulthood, succeeded by an increase after middle age (Blanchflower 2021; Li and Lu 2023). Considering the possible influence of the spouse's characteristics and behaviors, we also control for some spouses-related factors: spousal CCP membership (*Spouse_CCP*), spousal educational level (*Spouse_education*), age difference between own age and spousal age (*Age_difference*), and duration of marriage (*Marriage_duration*). Considering regional differences and year-wise heterogeneity, we further add both province and year dummies to the model.

In conducting heterogeneity analysis, it is important to note some significant variables: rural household registration (*Rural_hukou*), household with low income (*Low_houseincome*), participation in village committee election voting (*Political_vote*), and gender ideologies (*Gender_role*). Among them, if a household's income falls below the 50th percentile value of household income in the sample, *Low_houseincome* = 1, indicating that the household belongs to a low-income group; otherwise, *Low_houseincome* = 0. Gender ideologies (*Gender_role*) are evaluated through a five-item questionnaire, gauging respondents' agreement with statements such as: “1. Men should prioritize their career, while women should focus on domestic affairs.” “2. Men are inherently more capable than women.” “3. It is better for women to marry well than to strive for financial independence.” “4. During economic downturns, female employees should be laid off first.” “5. Housework should be equally shared between husbands and wives.” Respondents choose from a spectrum of options, each assigned numerical values ranging from 1 to 5. For the first four questions, a score of 1 corresponds to “completely disagree,” 2 to “disagree,” 3 to “neutral,” 4 to “agree,” and 5 to “completely agree.” In contrast, for the last question, the scoring is reversed, with 1 indicating “completely agree” and 5 indicating “completely disagree.” The cumulative scores for the five questions

³ The CGSS 2014 is still in the data cleaning stage and has not been released to the public for the time being. The CGSS was not conducted in 2016, so there is no related information on the CGSS 2016. The CGSS 2013, 2015, and 2017 share the same sampling frame and sampling method, but the CGSS 2012 and previous waves of surveys have different sampling frames and methods from the CGSS 2013.

⁴ In operation, $\text{Spouse_income} = \log(1 + \text{the spousal annual income})$.

TABLE 1 Variables and their definitions.

Variable	Definition
<i>Happiness</i>	Overall, are you feeling happy? (1–4, a larger value indicates a higher level of happiness)
<i>Spouse_income</i>	Logarithmic form of spouse's real annual income
<i>Income</i>	Logarithmic form of real annual income (we also account for the impact of the inflation rate, like how we handle <i>Spouse_income</i>)
<i>Han_ethnicity</i>	If you are a Han Chinese people (1 = yes, 0 = no)
<i>Urban_hukou</i>	If you have urban household registration (1 = yes, 0 = no)
<i>Religious_belief</i>	Types of religious beliefs (0 = no religious belief, 1 = Buddhism, 2 = Taoism, 3 = Folk religion, 4 = Islam, 5 = Christianity, 6 = other religion)
<i>CCP_member</i>	If you are a member of the Chinese Communist Party (1 = yes, 0 = no)
<i>Education</i>	Own education level (1–6, it is equal to 1 if illiterate, 2 if primary school, 3 if junior high school, 4 if senior high school, technical secondary school, vocational high school, and technical school, 5 if college degree, and 6 if bachelor degree and above)
<i>Social_equity</i>	The perception on social equity (1–6, a larger value indicates more social equity)
<i>Social_interaction</i>	The frequency of social interaction at free time (1–3, a larger value indicates more social interaction)
<i>Age</i>	Age
<i>Age_square</i>	Age square
<i>Spouse_CCP</i>	Spousal membership in the Chinese Communist Party (1 = yes, 0 = no)
<i>Spouse_education</i>	Spousal education level (1–6)
<i>Age_difference</i>	The difference between own age and spousal age
<i>Marriage_duration</i>	Duration of marriage in years
Variables used in heterogeneity analysis	
<i>Rural_hukou</i>	If you have rural household registration (1 = yes, 0 = no)
<i>Low_houseincome</i>	If your family belongs to a low-income group (1 = yes, 0 = no)
<i>Political_vote</i>	If you voted in village (neighborhood) committee elections (1 = yes, 0 = no)
<i>Gender_role</i>	Gender ideologies (5–25, a higher value indicates traditional gender ideologies)

are then totaled to create an ordinal variable reflecting attitudes toward gender roles, with higher values denoting more traditional gender ideologies. Detailed definitions of key variables are displayed in Table 1.

Descriptive statistics

Table 2 illustrates the distribution of *Happiness*, wherein “very happy” and “relatively happy” collectively constitute 79.03 percent, while the remaining 20.97 percent is attributed to “unhappy” and “relatively unhappy.” This suggests that individuals in the sample generally report a sense of happiness. Table 3 presents descriptive statistics for the key variables utilized in this study, indicating that Han Chinese constitute 92.5 percent, urban residents comprise 53.7 percent, and members of the CCP represent 12.1 percent. These statistics are consistent with the actual statistics of Chinese society in the 2010s and each wave of the CGSS (2013, 2015, and 2017), thus ensuring the sample's representativeness and laying a solid foundation for econometric analysis.

TABLE 2 Distribution of *Happiness*.

<i>Happiness</i>	Frequency	Percentage
Very happy	3,641	16.92
Relatively happy	13,375	62.12
Unhappy	3,044	14.12
Relatively unhappy	1,471	6.83

TABLE 3 Descriptive statistics of key variables.

N = 21,531	Mean	Std	Min	Max
Happiness	2.891	0.756	1	4
Female	0.513	0.500	0	1
Spouse_income	8.475	3.508	0	13.750
Income	8.539	3.439	0	13.789
Han_ethnicity	0.925	0.264	0	1
Urban_hukou	0.537	0.499	0	1
Religious_belief				
Buddhism	0.044	0.204	0	1
Taoism	0.002	0.041	0	1
Folk religion	0.016	0.125	0	1
Islam	0.020	0.140	0	1
Christianity	0.019	0.138	0	1
CCP_member	0.121	0.326	0	1
Education	3.129	1.352	1	6
Social_equity	2.137	0.879	1	3
Social_interaction	1.858	0.812	1	3
Age	50.413	14.247	18	94
Spouse_CCP	0.111	0.314	0	1
Spouse_education	3.094	1.346	1	6
Age_difference	-0.001	3.971	-51	40
Marriage_duration	26.740	14.765	0	91
Rural_hukou	0.463	0.499	0	1
Low_houseincome	0.558	0.497	0	1
Political_vote	0.512	0.500	0	1
Gender_role	13.775	3.489	5	25

Note: Here, we do not display "other religion" in religious belief due to its minimum representation.

Abbreviations: Mean, mean value; Std, standard deviation; Min, minimum value; Max, maximum value; N, number of observations.

Table 4 provides a comparative analysis of key variables between female and male samples, accompanied by *t*-test results. The findings reveal that females report significantly higher levels of happiness compared to males, with statistical significance at the 1 percent level. Additionally, spousal income is notably higher for women than for men, suggesting a potential positive correlation between women's happiness and their

TABLE 4 Comparison of some key variables.

Key variable	Female sample			Male sample			T-test
	N	Mean	Std	N	Mean	Std	
Happiness	11,050	2.904	0.757	10,481	2.877	0.755	0.027***
Spouse_income	11,050	9.371	2.699	10,481	7.068	4.361	2.303***
Income	11,050	7.736	3.961	10,481	9.501	2.541	-1.765***

Note: ***Significant at 1 percent.

TABLE 5 The Pearson correlation matrix.

Correlation coefficient	Spouse_income	Income
Han_ethnicity	0.033	0.034
Urban_hukou	0.239	0.246
Religious_belief	-0.038	-0.047
CCP_member	0.129	0.171
Education	0.291	0.318
Social_equity	0.009	0.012
Social_interaction	-0.015	-0.042
Age	-0.087	-0.048
Age_square	0.010	-0.004
Spouse_CCP	0.110	0.071
Spouse_education	0.265	0.225
Age_difference	0.037	0.135
Marriage_duration	-0.122	-0.096

TABLE 6 Variance inflation factor (VIF).

Variable	VIF
Spouse_income	2.31
Income	2.38
Urban_hukou	1.62
Education	2.47
Spouse_education	2.50

spouses' income. Conversely, men's happiness appears to be positively associated with their own income, which is significantly higher than that of women.

The Pearson correlations presented in Table 5 indicate generally modest associations among the core explanatory variable and control variables. Notably, the larger correlation coefficients are observed between income, education, and urban household registration, yet none exceeds 0.3. Additionally, the variance inflation factors (VIF) for these variables in Table 6 are all below 3, suggesting that multicollinearity is unlikely to be a significant concern in our econometric model. To further alleviate concerns of possible multicollinearity, a robustness check is carried out in the *Excluding potential variables to address multicollinearity* sec-

tion, wherein certain variables such as education, spousal education, and urban household registration are excluded.

ECONOMETRIC ANALYSIS AND INTERPRETATION

Econometric model

The study employs the ordinal logit model to test the association between spousal income and one's happiness, as the explained variable of *Happiness* increases from 1 ("relatively unhappy") to 4 ("very happy") in an ordinal, discrete manner. The econometric model is formulated as follows:

$$Happiness_i^* = \beta_0 + \beta_1 \times Spouse_income_i + X_i\theta + \mu_i, \quad (1)$$

where $Happiness_i^*$ is the latent variable of one's happiness, $Spouse_income_i$ is spousal income, β_1 is the parameter of interest X_i are control variables, and μ_i is a random error term.

Baseline regression results

Table 4 highlights a significant discrepancy in spousal income between the female and male samples, with husbands consistently earning higher income within families. As a result, this study conducts subgroup regressions to explore potential gender variations in the correlation between spousal income and individual happiness, and the detailed regression outcomes are outlined in Table 7. These findings unveil consistent and noteworthy gender differences in the connection between spousal income and individual happiness, regardless of whether year and province heterogeneities are controlled. Specifically, for wives, their happiness is positively correlated with their husbands' income but negatively correlated with their own income. Conversely, husbands experience a positive association between their own income and happiness, while their wives' income does not influence their happiness. This asymmetry in the spillover effect supports Hypothesis 1, indicating that a husband's income significantly contributes to his wife's happiness, while a wife's income exerts a lesser effect on her husband's happiness. This finding underscores the existence of an asymmetrical spillover effect of spousal income within a family, suggesting that the determinants of happiness for a couple differ. A wife's happiness is primarily linked to the improvement of family welfare through the spillover effect of her husband's income.

Heterogeneity analysis across rural-urban areas and household income

Our analysis reveals that a wife's happiness is primarily linked to her husband's income rather than her own. So, we need to consider the possible explanations for this phenomenon. Regarding this, we first examine whether there are any varying associations among different groups of women. Specifically, we investigate whether the positive correlation between a wife's happiness and her husband's income is more pronounced in some subgroups. A heterogeneity analysis is thus performed across different factors, such as rural-urban areas, and household income to gain further insights.

We introduce interaction terms of spousal income with two dummies of *Rural_bukou*, *Low_houseincome* into Equation (1), and Table 8 presents the results of the ordinal logit regression. The interaction terms for the female sample are significantly positive, whereas those for the male sample are not significant. These findings suggest that the positive correlation between spousal income and one's happiness is particularly prominent among women from rural areas and households with lower incomes. These characteristics indicate a lower socioeconomic status in contemporary China. Therefore, among women from a lower socioeconomic background, there exists a strong association between their happiness and their husbands' income.

TABLE 7 Baseline regression results.

Variable	(1)	(2)	(3)	(4)
	Female sample		Male sample	
Spouse_income	0.024** (0.010)	0.027*** (0.010)	0.009 (0.008)	0.011 (0.008)
Income	-0.019** (0.009)	-0.019** (0.009)	0.057*** (0.011)	0.061*** (0.011)
Han_ethnicity	-0.175* (0.098)	0.061 (0.088)	-0.159 (0.105)	0.057 (0.091)
Urban_hukou	0.040 (0.050)	0.042 (0.048)	-0.017 (0.051)	-0.042 (0.048)
Religious_belief				
Buddhism	0.217** (0.090)	0.226** (0.089)	0.231** (0.113)	0.223** (0.111)
Taoism	-0.389 (0.386)	-0.537 (0.388)	0.656 (0.560)	0.598 (0.587)
Folk religion	0.028 (0.154)	-0.188 (0.147)	0.153 (0.178)	0.047 (0.170)
Islam	0.093 (0.188)	0.477*** (0.153)	0.305 (0.217)	0.811*** (0.187)
Christianity	0.047 (0.128)	0.115 (0.126)	0.155 (0.174)	0.172 (0.171)
Other religion	-1.144*** (0.321)	-1.398*** (0.164)	-0.083 (0.098)	-0.288*** (0.079)
CCP_member	0.176** (0.082)	0.152* (0.081)	0.307*** (0.056)	0.313*** (0.055)
Education	0.082*** (0.024)	0.099*** (0.023)	0.042* (0.024)	0.048** (0.023)
Social_equity	0.595*** (0.024)	0.579*** (0.024)	0.631*** (0.025)	0.629*** (0.025)
Social_interaction	0.186*** (0.025)	0.168*** (0.024)	0.223*** (0.026)	0.210*** (0.026)
Age	-0.023*** (0.006)	-0.018*** (0.006)	-0.017*** (0.006)	-0.019*** (0.006)
Age_square	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Spouse_CCP	0.331*** (0.057)	0.334*** (0.056)	0.044 (0.089)	0.041 (0.088)
Spouse_education	0.129*** (0.024)	0.146*** (0.023)	0.149*** (0.025)	0.152*** (0.024)
Age_difference	0.000 (0.006)	0.003 (0.006)	-0.003 (0.007)	-0.006 (0.007)

(Continues)

TABLE 7 (Continued)

Variable	Female sample		Male sample	
	(1)	(2)	(3)	(4)
Marriage_duration	0.027*** (0.006)	0.023*** (0.006)	0.023*** (0.006)	0.025*** (0.005)
Year and province dummy	No	Yes	No	Yes
Pseudo R^2	0.061	0.048	0.069	0.057
N	11,050	11,050	10,481	10,481

Note: Robust standard errors are given in parentheses, and *, **, and *** indicate significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

TABLE 8 Heterogeneity effect across rural-urban areas and household income.

Variable	Female sample		Male sample	
	(1)	(2)	(3)	(4)
Spouse_income* Rural_hukou	0.020* (0.012)		-0.003 (0.012)	
Spouse_income* Low_houseincome		0.028** (0.012)		0.015 (0.014)
Covariates	Yes	Yes	Yes	Yes
Year and province dummy	Yes	Yes	Yes	Yes
pseudo R^2	0.061	0.064	0.069	0.072
N	11,050	11,050	10,481	10,481

Note: The ordinal logit model is used here. Covariates are the same to those in Table 7. Robust standard errors are given in parentheses, and *, **, and *** indicate significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Explanations for the heterogeneity

To elucidate the observed heterogeneous association, we posit a hypothesis suggesting that women from a lower socioeconomic background contend with relative disadvantages across multiple aspects of life, experiencing limited opportunities for economic and political participation. These constraints may result in a heightened reliance on their husbands for improved well-being. Furthermore, within the context of traditional Chinese society, it is common for women of lower socioeconomic status to conform to traditional gender ideologies, which frequently highlight the idea that men are focused on external affairs, while women attend to internal matters. This trend could further underscore the significance of husbands' income for women's happiness, particularly among those from lower socioeconomic backgrounds.

Therefore, the primary objective of this section is to scrutinize whether our sample substantiates the hypothesis. Political participation is gauged through involvement in village (neighborhood) committee election voting (*Political_vote*), while economic participation is appraised by personal annual income (*Income*). Gender ideologies are manifested through individuals' opinions on gender role arrangements (*Gender_role*). To empirically examine the economic and political participation, as well as the gender ideologies of women with lower socioeconomic status, three econometric models are formulated. In these models, *Political_vote*, *Income*, and *Gender_role* function as explained variables, while interaction terms between gender identity and rural household registration, along with lower household income, serve as explanatory variables.

TABLE 9 Political-economic participation and gender ideologies in lower socioeconomic status women.

Variable	(1) Political vote	(2) Annual income	(3) Gender ideology	(4) Political vote	(5) Annual income	(6) Gender ideology
Rural_hukou*Female	-0.383*** (0.061)	-0.799*** (0.085)	0.612*** (0.090)			
Low_houseincome*Female				-0.304*** (0.060)	-0.501*** (0.082)	0.813*** (0.091)
Covariates	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Province dummy	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo/adj. R^2	0.102	0.190	0.116	0.103	0.206	0.119
N	21,531	21,531	21,531	21,531	21,531	21,531

Note: Covariates include Han ethnicity (*Han_ethnicity*), rural household registration (*Rural_hukou*), religious belief (*Religious_belief*), the CCP membership (*CCP_member*), educational level (*Education*), the perception on social equity (*Social_equity*), the frequency of social interaction at free time (*Social_interaction*), age (*Age*), and age square (*Age_square*). Robust standard errors are given in parentheses, and *, **, and *** indicate significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

The regression results are presented in Table 9. Notably, the interaction terms show significant negativity in Columns (1), (2), (4), and (5), while they are significantly positive in Columns (3) and (6). Consequently, women with lower socioeconomic status demonstrate diminished rates of political participation and lower personal income levels. Furthermore, these women tend to adhere to traditional gender role expectations that position women as inferior to men within the family structure. These findings emphasize the disadvantaged position faced by women from lower socioeconomic backgrounds, underscoring the imperative for interventions to enhance their access to resources and opportunities and to challenge gender inequalities.

Overall, women remain in a subordinate position compared to men in both political and economic spheres. Their political participation is inadequate, and their annual income tends to be comparatively lower. Faced with these tangible challenges, women are more prone to conform to traditional gender norms. Consequently, it is probable that the well-being of disadvantaged women can be enhanced through their husbands' income rather than their own. Thus, Hypothesis 2 is substantiated.

NN-matching and IPW for causal inference

NNM method

To mitigate potential bias from self-selection effects, particularly in the context of individuals with high- or low-income spouses, traditional methods like ordinary least squares and ordinal logit models are deemed ineffective (Gilligan and Sergenti 2008). To address this, we first employ the one-to-one nearest neighbor matching (NNM) method, recommended for causal inference by statisticians and econometricians. This method constructs a new sample simulating a randomized experiment, ensuring the comparability of observable covariates between treatment and control groups. Wooldridge's (2010) recommendation guides the selection of nearest neighbors based on Mahalanobis distance for continuous covariates and exact matching for binary ones. To enhance the predictive accuracy for high spousal income, matching variables include family background covariates, aligning with Morgan and Winship's (2014) suggestion⁵. A

⁵ These matching covariates include binary variables: spousal household registration (*Spouse_urban_hukou*), spousal parents' property rights to the house where you are residing (*Spouse_parents_house*), the CCP membership (*CCP_member*), spousal CCP membership (*Spouse_CCP*), father's CCP

TABLE 10 The nearest neighbor matching (NNM) results.

NNM	(1)	(2)
	Male	Female
ATT (<i>Spouse_high_income</i>)	0.007 (0.036)	0.135*** (0.031)
N	6192	6254

Note: Only matched samples are kept, so the number of observations is less than that in Table 7. Robust standard errors are given in parentheses, and *, **, and *** indicate significance at the 10 percent, 5 percent, and 1 percent levels, respectively. Abbreviation: ATT, average treatment effect on the treated.

TABLE 11 Balance test of covariates in nearest neighboring matching.

Subsample		Mean difference of <i>Age</i>	Mean difference of <i>Spouse_age</i>
Male	Raw sample	-0.186	-0.183
	Matched sample	-0.085	-0.076
Female	Raw sample	-0.360	-0.359
	Matched sample	0.030	0.036

Note: All binary covariates in the spouse's income have the exact match (i.e., *Spouse_rural_hukou*, *Spouse_parents_house*, *CCP_member*, *Spouse_CCP*, *Father_CCP*, *Mother_CCP*, *Dummy_education*, *Dummy_spouse_education*, and *Father_work_unit*), and we remove large-sample bias by using a linear model (Abadie and Imbens, 2011), while including two continuous covariates: *Age* and *Spouse_age*.

dummy variable (*Spouse_high_income*) is created to signify spousal income above the 50th percentile⁶, allowing for the calculation of the average treatment effect on the treated group (ATT) by comparing means between matched samples.

Table 10 displays NNM method estimation results, adjusting standard errors to address potential estimator inconsistencies when matching multiple continuous covariates (Abadie and Imbens 2011). In Column (2), the significantly positive average treatment effect on the treated (ATT) of husband's income suggests a positive impact on his wife's happiness. However, Column (1) indicates no impact of wife's income on her husband's happiness. Column (2) reveals that the positive ATT of husband's income on his wife's happiness is significant. These findings align with earlier results. Covariate balance summary statistics in Table 11 demonstrate improved balance across variables post-NNM matching, meeting the quasi-randomization requirement. The standardized difference in means for continuous covariates (*Age* and *Spouse_age*) approaches zero, indicating enhanced balance in our model.

Inverse probability weighting method

In scenarios where outcome data are readily available, a notable limitation of NN-matching is its potential underutilization of data (Stuart, 2010). This stems from the exclusion of certain control individuals, even those with propensity scores within the range of the treatment group's scores. In contrast, weighting methods, such as inverse probability weighting (IPW), incorporate all individuals by assigning weights between 0 and 1. Unlike NNM, which essentially assigns weights of 0 or 1 based on whether individuals are selected as a match, IPW adjusts for selection bias and confounding by reweighting observations according to their

membership (*Father_CCP*) and mother's CCP membership (*Mother_CCP*), my father was employed by a government agency when I was 14 years old (*Father_work_unit*), education level dummy (*Dummy_education*), and spouse's education level dummy (*Dummy_spouse_education*), and also include two continuous variables: age (*Age*) and spousal age (*Spouse_age*).

⁶ We attempted to define a dummy variable, *Spouse_high_income*, set to 1 if the spousal income exceeds the mean value of *Spouse_income*. However, there was no discernible difference in our NNM results.

TABLE 12 The inverse probability weighting (IPW) results.

IPW	(1)	(2)
	Male	Female
ATT (Spouse_high_income)	0.034 (0.031)	0.133*** (0.037)
N	9036	9527

Note. Robust standard errors are given in parentheses, and *, **, and *** indicate significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Abbreviation: ATT, average treatment effect on the treated.

TABLE 13 The relative importance of spousal income and own income.

Rank	(1)	(2)	(3)	(4)
	Male	Female	Rural female	Low household income female
1	<i>Income</i>	<i>Spouse_income</i>	<i>Spouse_income</i>	<i>Spouse_income</i>
2	<i>Spouse_income</i>	<i>Income</i>	<i>Income</i>	<i>Income</i>

Note. The rank was determined by the average incremental contribution of the two variables of interest to the model estimate when controlling for other covariates as in Table 7.

estimated probabilities of receiving the treatment. The IPW results in Table 12 demonstrate a positive treatment effect of a husband's income on his wife's happiness, while a wife's income has no effect on her husband's happiness.

Robustness test

Dominance analysis

We further employ dominance analysis (DA) to determine which income source plays a more crucial role in enhancing one's happiness. DA gauges the relative importance of variables in a model by examining the proportion of each variable's contribution to the model fit (Gromping 2007). It compares the degree to which variables reduce prediction errors in a statistical model, enabling a determination of their relative importance. Table 13 presents the rankings of spousal income and own income. The results in Columns (2–4) show that while controlling for other relevant variables, for female sample, including those from rural areas, and households with lower income, the rank of spousal income is higher than own income. Therefore, compared with wife's income, her husband's income occupies a relatively more important position in her own happiness. In contrast, Column (1) reveals that husband's income has a more important place in his own happiness.

Replacing the explained variable

Apart from happiness, the study also considers life satisfaction as an alternative measure of subjective well-being, given both happiness and life satisfaction contribute to subjective well-being. Life satisfaction is measured using a question in the CGSS 2013 survey⁷, which asks respondents to indicate their level of

⁷ Unfortunately, this question is not included in the CGSS 2015 and 2017 surveys, and therefore, we use the CGSS 2013 survey for the following analysis.

TABLE 14 Robustness test by replacing the explained variable.

Variable	(1)	(2)
	Male	Female
Spouse_income	0.023** (0.009)	0.094*** (0.018)
Income	0.067*** (0.019)	0.005 (0.010)
Covariates	Yes	Yes
Year and province dummy	Yes	Yes
Pseudo R^2	0.051	0.053
N	3603	3526

Note: The explained variable is life satisfaction (*Life_satisfaction*). Covariates are the same with those in Table 7. Robust standard errors are given in parentheses, and *, **, and *** indicate significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

TABLE 15 Robustness test by excluding potential variables that may lead to multicollinearity.

Variable	(1)	(2)
	Male	Female
Spouse_income	0.017** (0.008)	0.032*** (0.010)
Income	0.062*** (0.011)	-0.015* (0.009)
Covariates	Yes	Yes
Year and province dummy	Yes	Yes
Pseudo R^2	0.069	0.061
N	10,481	11,050

Note: Covariates are identical to those in Table 7, with the exclusion of *Education*, *Spouse_education*, and *Urban_hukou*. Robust standard errors are given in parentheses, and *, **, and *** indicate significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

agreement with the statement: "I have a comfortable life without worrying about much for my life." The response options range from "completely disagree" to "completely agree," with corresponding values of 1–4. The results in Table 14 show that husband's income is three times more important than wife's income in determining husband's life satisfaction. Moreover, wife's life satisfaction is positively associated with her husband's income, but not with her own income. Therefore, whether measuring happiness or life satisfaction, the well-being of wives is significantly associated with their husbands' income.

Excluding potential variables to address multicollinearity concerns

Concerns arise intuitively regarding the correlation often observed between income, education, and urban household registration. The simultaneous inclusion of these variables in a regression model may lead to multicollinearity. While both correlation coefficient and VIF suggest that multicollinearity is not a significant issue in our model, to address potential concerns, we conduct a robustness check by excluding variables such as *Education*, *Spouse_education*, and *Urban_hukou* from the model. Subsequently, we rerun the regression based on Equation (1). The results of the ordinal logit regression are presented in Table 15. It is evident that a wife's happiness is positively linked to her husband's income but not to her own income. Conversely, a husband's income is three times more impactful than her wife's income in determining the

husband's happiness. Thus, the findings remain robust even after excluding variables that might lead to multicollinearity.

CONCLUSION AND IMPLICATION

This study uses the CGSS data set to investigate the relationship between spousal income and an individual's happiness. After controlling for potential confounding variables, our findings indicate a positive correlation between women's happiness and their husbands' income, whereas men's happiness is weakly or even not related to their wives' income. To alleviate the possible self-selection bias, we employ the NN-matching and IPW methods and obtain consistent results with the baseline regression. Additionally, the dominance analysis and other robustness checks further support our findings. Heterogeneity analysis indicates that the association is particularly pronounced among women with a lower socioeconomic status who face visible and invisible barriers in life and have limited participation in economic and political affairs. Overall, this study provides insights into how spousal income influences happiness and sheds light on gender-related inequalities in socioeconomic status and well-being.

Despite progress in women's empowerment, gender disparities continue to persist in several areas, particularly in politics and economy. In the male-dominated political culture of China, women are often considered unsuitable for roles that require determination and courage (Howell 2006), resulting in discrimination in both visible and invisible ways during the nomination and selection process of influential officials. This social context has resulted in a serious underrepresentation of women in high-level political positions. To address this issue, it is crucial to address the stereotypes and glass ceiling effect that hinder women's political careers. Similarly, the gender gap between men and women in economic fields is not narrowing but widening (Iwasaki and Ma 2020). Female labor force participation (FLFP) was ranked highest globally before the market reform period, and the gender wage gap was small during the centrally planned economy. However, since the implementation of the reform and opening-up policy, FLFP has declined, and the gender wage gap has widened (Chen 2019). Various factors contribute to this trend, such as work-family conflict, insufficient childcare services, and discrimination against female workers, among others (Jia and Dong 2013; Ma 2022). Therefore, addressing these factors is crucial to improving women's economic situation and reducing gender disparities in the workforce.

In a society that is not supportive of women, policies tend to prioritize men's interests and values over women's. Even policies that may appear to benefit women, such as maternity leave, can ultimately result in discrimination against them in the labor market. While women are granted paid leave, there is often no equivalent measure for men. Consequently, women are often assigned trivial responsibilities in a company and are the first to be laid off during economic downturns (Uribe et al. 2019). Thus, women are increasingly becoming a marginalized and disadvantaged group, making it difficult for them to achieve financial independence and career success. As a result, many women must rely on their husbands' achievements and identities to improve their well-being (Wang, Cheng, and Smyth 2019). The notion of marrying up to attain a higher socioeconomic status is still prevalent among Chinese women (Chen 2018). This does not necessarily imply that women prefer traditional gender norms where they are subordinate to men, but rather that they are forced into a disadvantaged position where they must rely on men for their well-being. Given that governments at all levels hold various institutional factors that influence women's economic and political participation, they should continue to eliminate gendered institutions that restrict women's abilities through law enforcement and media promotion.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

ETHICS STATEMENT

This study does not contain any studies with human participants or animals performed by any of the authors.

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