INVESTIGATING THE IMPACT OF TIME ALLOCATION ON FAMILY WELL-BEING IN CHINA

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Abstract. This study aims to analyze the relationship between family time allocation patterns and subjective well-being of Chinese married women. Using the fixed-effect ordered logit model and data from CFPS 2014–2018, this study empirically explores the impact mechanism and heterogeneity of family time allocation patterns on married women's well-being. The results indicate that the mode of working full-time and handling the majority of housework is an impact negatively for women, and this result is robust. Further heterogeneity analysis reveals that market work has a weaker impact on low-educated women's well-being than housework, but this is reversed for high-educated women. In particular, the single-time poverty brought on by housework specifically reduces women's well-being, more than that of dual-time poverty of work time and housework time. Also, the happiness efficiency resulting from women reducing housework time will increase with the rise in happiness levels. Accordingly, this paper highlights three policy implications: enhancing happiness effectiveness, optimizing family time allocation patterns, and raising women's status. The conclusion clarifies the path to gender equality in family labor division and provides new recommendations for relevant nations on how to promote the equalized gender division of labor and enhance the standard of living for women.

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1. Introduction

Social and cultural shifts have accelerated the rearrangement of gender roles during the last century.

Women have made significant progress in work and education, yet substantial gender gaps in time allocation remain (Davidson & Burke, 2016). The World's Women 2020 report states that less than half of all women of working age are entering the labor force, even though women spend an average of 4.2 hours per day – three times more than men –on unpaid household and care work (United Nations Department of Economic and Social Affairs, 2020). Additionally, women still engage in much less market work than men in households with two earners (OECD, 2021). Even if some women have the same or even more resources than men, they still have to devote more time to housework and caregiving.

Since the Industrial Revolution, researchers have studied on married women's time allocation. This is related to the expansion of women's participation in the labor force in Western nations and the theoretical support of feminism in public policy. With the development of sociological structural-functionalist theory in the late 1950s, many researchers shifted their studies' focus on intra-household labor division and the impact of gender norms on time allocation (Shi, 2006). The "male-dominated and female-dominated" division of labor is reinforced by traditional gender norms that categorize men as "external" and instrumental and women as "internal" and emotional. It has been shown that the division of time between spouses for professional and domestic work is not a straightforward trade-off or premium (Vedder, 2023).

Under the influence of both Eastern and Western cultures, traditional gender norms have evolved. Briefly, the West generally supports individualism, whereas the East generally supports collectivism. Collectivistic cultures place more emphasis on interdependence, collectivity, and relational harmony, whereas individualistic cultures emphasize individual independence, agency, and assertiveness, which are consistent with the "male roles in traditional gender norms". The collectivist qualities associated with female roles are frequently more highly valued in collectivist cultures (Krys et al., 2022). In such cases, women in Eastern countries may have to endure more hardships than men in order to challenge traditional gender roles. At this stage, it is worth assessing if a fair distribution of labor may improve women's well-being or whether there are drawbacks to defying social conventions.

China presents a nuanced context where gender inequality, rooted in Confucianism and a patriarchal agrarian past (Qing, 2019), coexists with a growing influence of Western individualism since the 1980s reforms. While collectivism still shapes societal norms, women's choices are subtly bound by traditional gender roles. However, they are increasingly challenging stereotypes to pursue personal growth and equality. As modern Chinese culture evolves, traditional notions like women nurturing families and men being providers are losing ground. The country's commitment to gender equality and women's comprehensive development, as outlined in the Outline for the Development of Chinese Women (2021–2030), underscores its civilizational progress. Fair distribution of labor time becomes vital amidst the conflict between women's personal aspirations and traditional domestic expectations.

The aim of this paper is to explore further the relationship between family time allocation patterns and subjective well-being of Chinese married women by addressing the the following questions: How do various family time allocation patterns affect women's happiness? Are some factors indirectly influencing the mechanism path of time allocation on well-being? How can the effectiveness of women's happiness under different allocation patterns be enhanced by the deprivation of work and household time? In order to answer the above questions, this paper uses sample coding to match couples' relationships and builds a fixed-effect ordered logit model using balanced panel data from the China Family Panel Studies (CFPS) in 2014–2018. This paper's findings not only offer suggestions for improving women's social standing and quality of life, but they also offer crucial references for advancing the development of a gender-equal civil society and establishing a scenario in which all genders benefit.

The rest of the paper is structured as follows: Section 2 reviews the pertinent literature, introduces the relationship between family time allocation and women's well-being, gender preference, and household division of labor, and describes the concepts and effects of work time poverty and household time poverty. Section 3 presents the theoretical model for the empirical study, and a fixed-effect ordered logit model is developed. Section 4 contains the

data, variables, and related descriptive analysis. Section 5 analyzes the empirical findings and conducts tests for heterogeneity. The conclusions are outlined in Section 6, together with potential policy ramifications.

2. Literature review

2.1. Working time and subjective well-being

To date, there has not been much research done explicitly examining the effects of time allocation practices on married women's well-being. Most previous research has been devoted to exploring the variables that affect women's well-being, including external variables like marital compatibility (Chapman & Guven, 2016), family relationships (Wu & Zheng, 2020), and traditional cultural perceptions (Diaz & Bui, 2016), and the effects of personal variables like fertility needs (Balbo & Arpino, 2016), educational attainment (Jongbloed, 2018), perceived family status (Li, 2021), and occupational characteristics (Navarro & Salverda, 2019). An examination of this literature on the elements affecting women's well-being reveals it to adhere to the conventional viewpoint, but it can serve as a crucial guide for choosing the variables in this research.

Another category of literature that is highly relevant to this study focuses on the impact of labor time on individual well-being. According to research by Okulicz-Kozaryn and da Rocha Valente (2017), in the U.S., higher labor force participation reduces women's average happiness. Khalil and Mansour's (2021) research suggests that social and cultural factors determine how work will affect personal well-being. Zhang (2019) conducted an empirical analysis using data from Inner Mongolia University's time use survey and discovered that both work time and housework time have a significant adverse impact on a person's well-being, with work time having a greater negative impact on women's well-being than on men's. Du et al. (2020) noted that the percentage of time spent by husbands on household chores had a considerable positive effect on wife satisfaction and showed an inverted U-shaped connection.

Along with the sharp rise in social productivity, labor production no longer depends on a physical strength advantage, women increasingly have the opportunity to pursue occupations and earn a living, the gender gap in the workplace is steadily closing, and dual-earner relationships are now the most common kind of relationship. Statistically, while the observed patterns of work time distribution in dual-earner families vary, the vast majority of families have husbands who maintain full-time employment and wives who are more likely than husbands to work part-time (Booth & Van Ours, 2008). For example, in Chinese households, China News Network says that more than 65% of women worked or planned to work side during the epidemic. Moreover, owing to family obligations, social expectations, and other circumstances, women also have a harder time transitioning from part-time to full-time employment (Muñoz-Comet & Steinmetz, 2020).

Studies on the processes of time allocation on women's well-being have been conducted because of the overrepresentation of women in part-time work. Based on data from the U.K. Household Panel Survey, Bridges and Owens (2017) found that women who work part-time can make flexible lifestyle decisions that increase their job satisfaction but that this effect declines significantly as women's educational attainment increases. Valente and Berry (2017) emphasize the role of cultural values, especially the contrast between collectivism and individualism, in shaping the connection between work hours and well-being.

Álvarez and Miles-Touya (2015) studied Spanish dual-income couples and found that life satisfaction is affected by the mix of paid work and unpaid domestic work. Women with full-time jobs and primary household responsibilities experience lower life satisfaction, indicating persistent gender norms in Spain.

In summary, part-time work offers women greater work-life balance and improved well-being due to flexibility and enhanced social roles, boosting family status. However, it can also reflect limited choices and societal constraints, often coming with lower status, wages, and fewer growth opportunities, potentially negating its positive impact on well-being due to reduced financial security.

In fact, exploring the connection between women's part-time work and well-being cannot be separated from the family context and social context; for the majority of women, choosing to work part-time is a decision they must make to balance family and work in order to meet conventional social expectations, and doing too much housework can be detrimental to women's well-being (Foster & Stratton, 2019). Therefore, to ensure the completeness and accuracy of the estimation results, it is crucial to evaluate the relationship between time allocation and women's well-being not just in terms of the working time dimension alone but also in terms of how the division of household chores plays a role in this pathway. This issue is fundamental in countries where women are primarily responsible for household responsibilities, such as East Asian countries like China, Japan, North Korea, and South Korea, where the majority of women still have to take on the role of raising and educating children (Varshney, 2019) and where part-time work can be seen as a desperate choice to uphold traditional gender responsibility patterns (Díaz, 2022).

2.2. Gender and intra-household time allocation

In analyzing the mechanism of time allocation patterns on well-being, new family economist Becker (1981) found that when the wife's market wage level decreases relative to her husband's, she chooses to engage in more household production. This hypothesis has been tested numerous times (Lundberg & Pollack, 1993; Juhn & Murphy, 1997). It has been demonstrated, though, that even when women work full-time, their share of household work does not reduce as a result. Women continue to carry the bulk of the load at home, and gender discrepancies in domestic time remain (Ciciolla & Luthar, 2019). A rising number of academics claim that this phenomenon may be best explained by established gender norms and the positioning of roles within the home. Because of this normative restriction, women nevertheless decide to do more of the domestic chores even when they work full-time and contribute the majority of the household's revenue (Akerlof & Kranton, 2000, 2010).

Based on the multiple repercussions of deviating from gender norms, the extant literature investigates the mechanisms linking family members' behavioral results to their degree of satisfaction. Salland (2018) estimated the contribution of intra-household income disparities on individual life satisfaction using German household panel data and found that the happiness of couples declines by 8% when the wife predominantly handles the domestic responsibility of providing for the family. Similarly, Wu (2020) observed that couples with normative deviations from traditional gender roles, such as when the wife earns more than the husband, tend to be less satisfied than couples where this is not the case. In traditional societies that emphasize cultural values, such as China, Japan, and South Korea, fulfilling appropriate social roles is considered to contribute to social harmony; however, fulfilling

traditional gender roles is more likely to have an impact on individual well-being, so to some extent, engaging in full-time work instead detracts from women's well-being (Hori & Kamo, 2018).

In Chinese families, there is a deep-rooted patriarchal notion that stresses the role of men as the "backbone" of the household and society, while women are subordinate to men and play a supportive role in "childbearing and child rearing" (Li, 2002). Owing to this gender norm, women evaluate their spouses' contributions to family responsibilities and self-worth in terms of "male dominance and female dominance," the socially acceptable division of roles. Once the invisible boundaries of conventional norms are crossed, their well-being could suffer (Li & Feng, 2021). In other words, women are content with the gender-stereotyped time pattern in which husbands perform the bulk of market labor and wives handle most of the domestic duties. However, in reality, the heterogeneity of various priorities must be taken into account in order to conduct thorough research on mechanisms generating female happiness, given women's varying preferences for gender norms. Women's preference for gender norms is directly reflected in their attitudes toward gender equality, and for reasons of data availability, scholars in actual research typically use indicators like educational level, conjugal family power, responsibility, and attitudes toward gender roles to reflect perceptions of gender equality (Liu & Tong, 2014; Khurshid, 2016; Lin & Ye, 2015).

2.3. Working time poverty and household time poverty

The impact of time allocation on subjective well-being can be traced back to the constraints of time as a scarce resource. Gronau (1977) first proposed a trichotomy of time allocation – work time, housework time, and leisure time. Time poverty occurs when a person's rest time is significantly reduced as a result of the amount of time they devote to work and household chores exceeding a certain threshold. In this paper, time poverty caused by work is defined as work time poverty, while time poverty caused by household chores is defined as family time poverty. Which form of time poverty occurs depends on how differently individuals allocate their time between work, family, and leisure.

It has been shown that diverse time allocation preferences have been found to trap individuals in quite different forms of time poverty. Modern women strive to balance taking care of their families with actively seeking market labor opportunities (Gao, 2017). Women are willing to actively engage in market labor at the sacrifice of leisure, however, influenced by traditional gender norms and social and cultural backgrounds, women still passively take on a significant amount of household work (Zilanawala, 2016; Iqbal et al., 2020), and this phenomenon is particularly prominent in Chinese households, where the wife's labor burden is much higher than that of the United States or Japan, stemming from the shrinking work time differential and the fluctuating household time differential between couples (Foster & Stratton, 2018). The happiness cost associated with household time poverty still outweighs the sense of achievement and access that working time poverty can provide. In contrast, men continue to allocate their time according to conventional patterns, with gender norms dictating their apparent preference for market labor. Meanwhile, several studies have discovered that improving the husband's share of household chores reasonably helps alleviate the wife's time poverty while also contributing positively to family relationships (Foster & Stratton, 2019).

Most current studies on women's time poverty have taken the total amount of time spent working as their starting point. These studies have demonstrated that women are particularly vulnerable to working time poverty in the contradiction between work and family, which causes a corresponding decline in their well-being (Du, 2020). However, an absence of literature starts creates two separate starting points for the perspectives of working time poverty and household working time poverty. Although the market share of women's labor is gradually rising, they remain unable to escape the division of caregiving roles (Onozaka & Hafzi, 2019). Women's time poverty primarily originates from the market or domestic labor when they work and take on domestic tasks at the same time? Are there gender variations in working time poverty and household time poverty? How do working time poverty and household time poverty act on the level of well-being of each gender? Therefore, discussing the pathways of time poverty and happiness separately from the perspectives of work time and housework time is necessary.

In summary, existing research primarily explores the mechanisms of labor time and its elements influencing well-being from a single perspective, while there is a shortage of studies that integrate the examination of how the unreasonable allocation of work time and household time affects women's well-being. Compared with previous studies, the contributions of this paper are found primarily in the following three aspects: First, based on the coexistence of the changing Chinese family division of labor structure and traditional gender norms, individual characteristics, family characteristics, and social characteristics are incorporated into the causal study of women's time allocation patterns and their subjective well-being, and an in-depth analysis of how work time and family time act on women's well-being penalties is provided. Second, we identify the heterogeneity of family demands and gender normative preferences and objectively analyze the mediating effects of family needs, education level, and social status perceptions on the generation mechanism of women's happiness. Third, we comprehensively consider whether women have the right to allocate their free time as they wish and evaluate the impact of the differences in women's happiness caused by various forms of time poverty from the perspectives of working time poverty and household time poverty. Our goal is to provide new views and paths for research in the fields of women's development, individual well-being, and gender economics.

3. Empirical approach

This paper examines how time allocation patterns affect women's well-being after controlling for various socioeconomic and demographic factors. We postulate that the preferences of spouses and the conventional cognitive standards they are exposed to determine the time allocation patterns among couples. The study does not identify the method by which couples negotiate this pattern; instead, it solely analyzes how wives' subjective well-being is affected by time allocation patterns. Thus, we initially specify the following latent model.

$$Happiness_{it} = \beta_0 + \beta_1 T_{it} + \beta_2 X_{it} + \mu_i + \varepsilon_{it}, \tag{1}$$

where *Happiness* indicates the wife's subjective well-being, the primary explanatory variable *T* Describes the distribution of time between market and non-market work for the wife; As control variables, *X* explain the effects of individual, household, and social factors on well-being; *t* and *i* signify the year and the wife, respectively. β is parameters to be estimated, μ represents individual fixed effects, ε_{it} is a random perturbation term.

Fixed-effects ordered logit model uses latent variables *Happiness** to relate observable characteristics *T* and *X* to observable ordered dependent variables *Happiness*, where the dependent variable can take the values 0 – *K*. Individual's(*i*) latent variable $Happiness_{it}^*$ in time *t* is linearly determined by observable characteristics *T* and *X*, individual heterogeneity intercept term μ_i, and residual term ε_{it}. Where the individual heterogeneity intercept term μ_i does not vary over time and is statistically dependent on observable characteristics *T* and *X*; The residual term ε_{it} satisfies two assumptions: ε_{it} is independently and identically distributed, conforming to logistic distribution, and there is no serial correlation 4.3 Descriptive Analysis; ε_{it} Strictly exogenous to observable variables *T* and *X*, i.e.

$$E(\varepsilon_{it} \mid T_{it}; X_{it}) = 0. \tag{2}$$

The relationship between *Happiness* and *Happiness** is as follows.

$$Happiness_{it} = k \ if \ \tau_{ik} < Happiness^* \le \tau_{ik+1}, \ \ k = 1, 2, \cdots, K, \tag{3}$$

where τ_{ik} is the intercept point and satisfies the strictly increasing, i.e.

$$\tau_{i1} = -\infty; \ -\infty < \tau_{ik} < \tau_{ik+1} < \infty, \ \ \forall k = 2, 3, \cdots, K-1; \ \tau_{ik+1} = \infty. \tag{4}$$

The residual term ε_{it} is independently identically distributed in the standard logistic distribution with the following expression.

$$F(\varepsilon_{it} \mid T_{it}; X_{it}) = F(\varepsilon_{it}) = \frac{1}{1 + \exp(-\varepsilon it)} = \Lambda(\varepsilon_{it}). \tag{5}$$

For each response probability of an individual in time is as follows.

$$\text{Prob}\left(Happiness_{it} = k\right) = \Lambda\left(\tau_{k+1} - \beta_1 T_{it} - \beta_2 X_{it} - \mu_i\right) - \Lambda(\tau_k - \beta_1 T_{it} - \beta_2 X_{it} - \mu_i). \tag{6}$$

4. Variables, data, and descriptive analysis

4.1. Working time poverty and household time poverty

4.1.1. Dependent variable

The subjective well-being of women is the study's dependent variable. Currently, the index "life satisfaction" is frequently employed to gauge happiness (Mo & Yang, 2018; Wang & Xu, 2019; Liu & Hu, 2022). This variable is gathered from the survey "How satisfied are you with your life?" The answers range from 1 (very unhappy) to 5 (very happy). A higher score on the happiness scale for women denotes a more satisfied degree of well-being.

4.1.2. Primary explanatory variable

The primary explanatory variable in this paper is the family time allocation pattern, including employment types and the division of household duties among couples. Drawing on the approach of Álvarez and Miles-Touya (2015), this paper distinguishes between full-time and part-time employment types to reflect women's allocation of time to work, and highlighting the division of labor and cooperation between individuals and their spouses in household duties.

The employment type is determined by the responses to the question, "How many hours per week do you typically work at this job?" According to the Chinese Labor Contract

Law, this paper defines part-time work as working no more than 24 hours per week and full-time work as working more than 40 hours per week. Compared to men, who only work part-time 14.69% of the time, the data shows that 75.23% of women work full-time and 24.77% work part-time.

The division of household duties was created based on the responses to the following survey questions: "In general, roughly how many hours a day do you dedicate to home chores?" "How long do you typically spend cleaning your home on weekdays?" and "How many hours a day, on average, do you spend cleaning the house on your days off?" These questions were answered by both the husband and the wife. Based on the respondents' responses, it is possible to determine the number of hours of housework and the percentage of housework input by married women. The rate of housework input is determined by comparing the individual work time with the total amount of housework input time contributed by both spouses. This paper divides housework-sharing patterns into three categories: husband-led, husband-wife-balanced, and wife-led. When women's contribution to household duties is less than 30%, this is known as the husband-led type; when it is between 30% and 60%, this is known as the husband-wife-balanced type; and when it is over 60%, this is known as the wife-led type.

By combining the wife's employment type with the division of household duties within the family, this paper defines six categories of family time allocation patterns: full-time working wives with housework dominated by the husband, dominated by the wife, or husband-wife-balanced; and part-time working wives with housework dominated by the husband, dominated by the wife, or husband-wife-balanced.

4.1.3. Control variables

In conjunction with existing literature, this paper also considers other variables that may have an impact on time allocation patterns and subjective well-being consisting of three main types – individual control variables, family control variables, and social control variables – to reduce the estimation bias caused by omitted variables.

The individual control variables include wife's age, education (Eduy), income, health, status, and gender role attitudes. Blanchflower and Oswald (2000) stated the relationship between age and subjective well-being was found to exhibit a "U"-shaped correlation. Consequently, this paper takes both age and the square of age into the analysis. The impact of income on happiness remains inconclusive; some scholars argue for a significant positive relationship between income and satisfaction (Graham & Pettinato, 2001), while others suggest the existence of a threshold where the influence of income on happiness diminishes once basic life needs are met (Zheng & Lu, 2013). Increasing education level has been shown to positively impact individual happiness (Jiang, 2019). Subjective perception of health is more influential on individual happiness than objective health status, particularly among older adults (Wei et al., 2020), and the subjective perception of health status in this paper is categorized from 1 (unhealthy) to 5 (very healthy). Regarding gender role attitudes, households with egalitarian gender attitudes tend to share household duties more equally, while women constrained by strong external cultural norms may experience more significant happiness loss due to "non-traditional" division of household labor (Álvarez & Miles-Touya, 2015). The importance of gender roles in this paper on a scale from 1 (unimportant) to 5 (crucial), Women's responses were included for 10 questions containing "family happiness and harmony," "family succession," and "close relationship with spouse."

The family control variables include differences in spouses' educational levels, relative income levels, wives' satisfaction with marriage, and family caregiving status. The "male stronger, female weaker" difference in education has a negative impact on husbands' sense of happiness, with the impact on wives' happiness being the opposite (Wang et al., 2017). This paper uses the relative education years of spouses (R_Eduy) which is the wife's years of education minus the husband's years of education to measure the differences in spouses' educational levels. Research shows that the higher the wife's relative income, the greater the negative impact on female happiness (Cheng & Wen, 2018). This paper represents relative income levels (R_Income) of spouses as the ratio of the wife's total annual income to the total annual household income. Regarding wife's marital satisfaction (Satisfaction), research confirms that groups with high marital satisfaction have higher levels of happiness, while groups with low marital satisfaction are even less happy than unmarried individuals (Chapman & Guven, 2016). The variable "the wife's marital satisfaction (Satisfaction)" encompasses the wife's satisfaction with the marriage, husband's financial contribution, and husband's household contribution. Considering that a family comprises both spouses, children, and other household members, research indicates that unequal time allocation between spouses diminishes the well-being of childless households, yet its impact is not significant for households with children (Le & Miller, 2012). Therefore, this paper measures the family caregiving situation by considering whether there are children or dependent adults in the household (Members).

Considering that individual's happiness is also influenced by the surrounding social environment (Lašáková et al., 2023), this paper introduces three social control variables. These variables include women's trust in others (Trust), which contains women's trust in parents, neighbors, strangers, local government officials, and doctors, taking values from 0 (very distrustful) to 10 (very trustful); women's perception of the comparative social pressure between men and women (Pressure), taking values of 0, 1, and 2, indicating that they believe men are under more pressure, women are under more pressure, or both face the same pressure; income's social status in the local society (R_Status), taking values from 1 to 5, with a higher score indicating that women believe that income has a higher status in local society. Generally, individuals tend to experience stronger happiness when they have higher levels of trust in others, perceive lower social pressures, and perceive higher income status in society. Additionally, this paper includes two dummy variables for province and urban-rural status to control for geographic variations.

4.2. Data

This paper examines the effect of family time allocation on women's subjective well-being based on the CFPS data. The CFPS sample covers 25 total provinces, municipalities, and autonomous regions in China (excluding Hong Kong, Macau, and Taiwan) (Xie & Hu, 2014). The survey has been conducted every two years since 2010, and five rounds of the survey have been completed so far. The CFPS's advantage is that it gathers a wealth of data on respondents' demographics, family structure, employment, time management, and subjective well-being.

This paper has selected data from 2014, 2016, and 2018. Although CFPS has released the survey data for 2020, severe data missing exist for the primary explanatory variables of this paper. Including the sample of 2020 in the model would significantly impact the sample

size of the balanced panel data, therefore the empirical research model in this paper does not include data from 2020.

According to the goal of this study, married couples in the CFPS survey data are first paired one by one. Then, samples that lack critical information about factors like subjective well-being, market labor time, household labor time, age, and years of education are deleted. Finally, samples that contain logical flaws and outliers in the data are also eliminated. The cross-sectional survey data spanning 2014, 2016 and 2018 are pooled to create balanced panel data for this study. There are 17523 final samples in total, and there are 5841 data for each era.

In early 2020, the COVID-19 pandemic led to temporary lockdowns globally, including in China, where social distancing and mask-wearing became norms. While some studies examined short-term time allocation shifts during strict lockdowns (Mesaric et al., 2022; Chauhan, 2022; Xu et al., 2021), long-term impacts are less studied. Using CFPS 2020 data, this paper reveals that women spent an average of 40.45 hours weekly on work and 21.44 hours on household chores, figures similar to pre-pandemic averages from 2014 to 2018 (Table 1). Combining the findings from the literature review and the data results mentioned above, this study suggests that the COVID-19 pandemic has not brought about significant changes in time allocation for married women and households in China.

4.3. Descriptive analysis

Table 1. Table of each variable's descriptive statistics

Variable Name	Mean	Standard Deviation	Maximum Value	Minimum Value
Subjective well-being	3.644	1.239	1	5
Hours of housework	20.576	12.679	0	147
Hours of market labor	41.613	23.066	0	168
Age	47.049	11.978	16	85
Squared term of age	2356.940	1142.297	0	7225
Years of education	5.735	4.892	0	19
Natural logarithm of income	4.7661	4.844	0	13.12
Health Status	3.154	1.237	1	5
Social status	3.068	1.056	1	5
Gender role concept	3.626	0.668	1	5
Relative years of education	−1.643	4.514	−19	16
Relative income level	0.373	0.289	0	1
Marital Satisfaction	3.924	0.895	1	5
Dependent relatives	0.953	0.212	0	1
Trust	5.552	1.393	1	10
Social pressure	2.317	0.889	1	3
Income status	2.689	1.065	1	5

This paper aims to investigate the effects of various family time allocation patterns on the contentment of married women. According to the data of the China Full-time Wives' Life Survey Report, the percentage of full-time wives in China is estimated to be only 26% as of 2021; combined with the CFPS survey's sparse data, the sample size for full-time housewives in this paper is extremely small. For the time being, this paper will not analyze the group of full-time housewives separately but will instead include them in the sample of women who work part-time.

Figure 1 displays the weekly averages for household time and working time for groups of women with varying levels of happiness in 2014, 2016 and 2018 as a whole. It is not difficult to discover that the general trend of household and working time among the various groups of women with varying levels of well-being throughout the three periods is the same. As a woman's level of happiness increases from 0 to 5, her time spent working in the market does not change significantly; on average, this time fluctuates around 40 hours. In contrast, her time spent on housework fluctuates greatly and becomes significantly shorter as her level of happiness rises. Those who are the least happy (having a happiness rating of 0) typically bear the most housework and work, but for married women, appropriate market labor and less housework are the best options.

Figure 1. Household and working time for each happiness level group

When women's occupations are broken down, the happiness of women who work full-time is much lower than that of women who work part-time, regardless of how domestic chores are distributed among them. This difference is primarily owing to the wife-dominated time allocation pattern of household chores, in which women who work full-time obviously suffer a greater happiness penalty. However, as shown in Table 2, the loss of happiness for wives can be somewhat mitigated if husbands take the initiative to share household responsibilities. Although there was no significant difference in the happiness of wives who worked full-time or part-time under the husband-led or husband-wife-balanced time allocation patterns, these two types of housework allocation patterns accounted for less than 50%, Only about 4.90% of households have a distribution pattern that is led by the husband.

Table 2. Average women's happiness by family time allocation pattern

	Patterns of housework allocation			All
	Husband-led	Wife-led	Balanced allocation	
Full-time job	3.856 (0.915)	3.300 (1.412)	3.857 (1.045)	3.532 (1.285)
Part-time job	4.146 (1.037)	3.982 (1.004)	3.950 (1.006)	3.978 (1.020)
P-value	0.096	0.000	0.103	0.000

5. Results

5.1. Effect of family time allocation patterns on women's well-being

Women who work full-time and evenly divide househol0onsibilities with their husbands are the reference category in this study as they represent the pattern of gender equality that is most likely to exist. For various family time allocation patterns, the results of the ordered probability estimate of women's well-being are presented in Table 3, and the complete set of calculated coefficients is reported in the Appendix. According to the estimation results, women's well-being is much poorer under the full-time employment pattern with the wife also performing most of the household tasks alone compared to women who work full-time and divide household duties equally with their husbands. No significant differences between the well-being of women who work part-time and the reference group (regardless of how home duties were distributed) were discovered when no control factors were added, as shown in column (1) of Table 3.

Next, three sets of control variables, including individual, family, and social characteristics, are sequentially included in the model, and the estimation results are shown in columns (2), (3), and (4) of Table 3. Based on the parameter estimates in the table, we conclude that when individual, family, and social factors are considered, women who work part-time report significantly higher subjective well-being than women who work full-time with the same distribution of household duties; conversely, women who work full-time report significantly lower subjective well-being when taking on a larger share of the household duties.

The impacts of the majority of the variables on women's satisfaction for the control variables are consistent with previous research, as shown by the estimation results in Table 8 (Mogilner & Norton, 2016; Bryson & MacKerron, 2017; Cheng & Wen, 2018; Chen, 2020). Age and women's happiness have a U-shaped relationship in terms of individual characteristics, which means that happiness tends to decline and then increase with age; education level has a negative and significant impact on women's happiness, whereas health status, social status, and gender role perceptions all have positive and significant effects.

Women's subjective happiness rises with relative income level and contentment with their husbands and increases considerably when there are dependent relatives in the family, among other family factors. Women's happiness is also positively influenced by their perception of their social standing and their level of interpersonal trust.

Table 3. Effect of family time allocation patterns on women's subjective well-being

Family Time allocation patterns	Dependent variable: female subjective well-being			
	(1)	(2)	(3)	(4)
Full-time job and housework performed by husband	0.080 (0.105)	0.060 (0.108)	0.060 (0.108)	0.073 (0.111)
Wife	−0.974*** (0.054)	−1.009*** (0.055)	−1.019*** (0.055)	−1.017*** (0.055)
Wife and husband	Reference	Reference	Reference	Reference
Part-time job and housework performed by husband	0.404 (0.226)	0.419 (0.212)	0.436 (0.209)	0.391 (0.212)
Wife	0.152* (0.084)	0.135** (0.086)	0.139*** (0.086)	0.131*** (0.086)
Wife and husband	0.107 (0.096)	0.075* (0.096)	0.069** (0.096)	0.059** (0.096)
Individual control variables	No	Yes	Yes	Yes
Family control variables	No	No	Yes	Yes
Social control vairables	No	No	No	Yes
Urban-rural	No	Yes	Yes	Yes
Province	No	Yes	Yes	Yes

Note: Standard errors are given in parentheses. Coefficient estimates are statistically significant at the 10% (*), 5% (**), or 1% (***) levels.

In light of the aforementioned regression results, this paper tested the robustness in several different ways. First, well-being was reclassified as a binary variable with "3–5" representing happiness (1) and "1–2" indicating unhappiness (0), then the assigned well-being and family time allocation mode and other control variables were assigned using fixed-effect ordered logit model. Column (1) of Table 4 indicates that women's happiness is still significantly impacted negatively by the mode of working full-time and primarily doing housework. Second, because the family time allocation pattern ultimately reflects how much time is spent working and how much time is spent with family, this study substitutes working hours, housework time, and the percentage of working hours and housework time for the primary explanatory variables before regressing. As can be seen in Table 4, column (2), the inappropriate allocation pattern will continue to severely erode women's happiness. Third, after removing the elderly population and minors, this paper conducts a regression analysis on a sample of females aged 18–60, and the results are displayed in column (3) of Table 4. After removing the sample, the regression results remain consistent with the previous results. Lastly, the benchmark is regressed using the mixed OLS regression model, and the results are displayed in Table 4, column (4), demonstrating once more how reliable and significant this model is for estimating women's happiness.

5.2. Heterogeneity of effects

The baseline regression section focuses on the typical impact of various family time allocation patterns on women's subjective well-being; however, as was already mentioned, family

membership, educational level, and social standing are a few characteristics that can influence the link between these two variables, potentially influencing heterogeneity. This paper divides the sample into groups according to the presence or absence of dependent family members (children or adults in need of care), women's educational attainment, and women's perception of their social status to further explore the heterogeneity of the effect of family time allocation patterns on women's well-being. The study also tests whether these results hold true for subsamples of women with different family needs and gender preferences.

Firstly, we reconstruct a regression model for the "dependent member" and present the results in columns (1) and (2) of Table 5 to take the heterogeneity of family demands into account. The results demonstrate that increasing family responsibilities might substantially raise women's life stresses and exacerbate their work-family imbalance, consequently lowering their level of well-being. However, for women who worked full-time, taking on most of the domestic work would have diminished their well-being, but having dependent members did not negatively affect the well-being of this group of women at the 5% statistical level. In contrast, women without dependent members show a marked decline in happiness. This is owing to take care of dependent relatives increases women's sense of responsibility to some extent, lessens their anxiety about their give-reward balance, and dramatically satisfies their needs for competence and relatedness (Zhang et al., 2022), which in turn makes up for the well-being loss brought on by an unbalanced time allocation.

Table 4. Robustness test result

Independent variable	Female subjective well-being			
	(1)	(2)	(3)	(4)
Full-time job and housework performed by husband	0.175 (0.119)		0.112 (0.121)	0.014 (0.048)
Wife	−1.038*** (0.056)		−0.951*** (0.063)	−0.550*** (0.021)
Wife and husband	Reference		Reference	Reference
Part-time job and housework performed by husband	0.419 (0.229)		0.278 (0.268)	0.228 (0.088)
Wife	0.089* (0.094)		0.025* (0.105)	0.093*** (0.030)
Wife and husband	0.234 (0.109)		0.048 (0.123)	0.041 (0.035)
Time of housework		−0.017*** (0.003)		
Proportion of housework		0.530 (0.338)		
Time of job		−0.006** (0.003)		
Proportion of job		−0.779** (0.360)		
Added controls	Yes	Yes	Yes	Yes

Note: Standard errors are given in parentheses. Coefficient estimates are statistically significant at the 10% (*), 5% (**), or 1% (***) levels.

Table 5. Analysis of heterogeneity among different female subsamples

Family Time allocation patterns	Dependent variable: female subjective well-being					
	Member		Education level		Perception of social status	
	(1) Yes	(2) No	(3) Less than high school	(4) High School	(5) Low	(6) High
Full-time job and housework performed by husband	0.132 (0.217)	0.031 (0.131)	0.049 (0.122)	0.117 (0.274)	–0.046 (0.134)	0.278 (0.207)
Wife	–0.214* (0.117)	–0.163** (0.078)	–0.117 (0.071)	–0.452*** (0.157)	–0.128* (0.078)	–0.274** (0.116)
Wife and husband	Reference	Reference	Reference	Reference	Reference	Reference
Part-time job and housework performed by husband	0.089 (0.459)	0.297 (0.292)	0.275 (0.282)	0.180 (0.519)	–0.226 (0.304)	0.891** (0.453)
Wife	0.320** (0.151)	0.235** (0.108)	0.275*** (0.096)	0.200 (0.212)	0.355*** (0.111)	0.125 (0.145)
Wife and husband	0.202 (0.151)	0.232* (0.128)	0.181 (0.113)	0.319 (0.232)	0.266** (0.129)	0.127 (0.166)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Urban-rural	Yes	Yes	Yes	Yes	Yes	Yes
Province	Yes	Yes	Yes	Yes	Yes	Yes

Note: Standard errors are given in parentheses. Coefficient estimates are statistically significant at the 10% (*), 5% (**), or 1% (***) levels.

Secondly, we quantify the impact of family time allocation patterns on the happiness of women with various levels of education in columns (3) and (4) of Table 5, separating the sample into two subgroups ("attended high school" and "did not attend high school") and maintaining other factors constant. The data reveal that women with part-time work (and primary household responsibilities) and less education have significantly higher happiness than those with full-time jobs. A possible explanation for this result is that less-educated homemakers are still subject to external solid traditional cultural norms, and their sense of subjectivity remains based on a family-oriented approach. A stereotypical pattern of domestic work division would instead make them feel happy. But for women with higher education, their happiness is not significantly related to market labor time allocation patterns and that taking on a full-time job and handling the main household tasks on their own rather than balancing them with their husbands causes a severe loss of happiness.

Thirdly, to further clarify how women's self-perception affects their time management and well-being, we categorized women into two groups based on their perceived level of their social status (low and high), and the results are presented in columns (5) and (6) of Table 5 respectively. The data support the heterogeneity of the relationship between relative social status and women's well-being. It is demonstrated by the most significant degree of happiness loss among women who work full-time with high self-perception and essential household

responsibilities. Through the mediating effect of equity perception, it has been demonstrated that social status perception positively affects happiness (Xu, & Chen, 2017). Women with high self-perceptions tend to have strong equity perceptions, pursue more independence and self-worth, and dare to challenge the normative constraints derived from traditional gender perceptions. However, the length of labor under the same pattern of domestic work is more likely to impact women with poor self-awareness (Lee & Tang, 2022). This may be because these women are more susceptible to the implicit influence of traditional gender norms, where increased work hours deplete their resources and cause unpleasant emotions such as anxiety and fatigue. Therefore, this has a considerably higher negative impact on women's well-being than dividing up domestic work.

5.3. Working time and household time poverty

The section above that examined how family time allocation patterns impact different sub-samples of women's well-being did not address whether women have the freedom to use their time however they see fit or whether they are trapped in time poverty. The prevalence of working time poverty and household time poverty will now be examined along with the degree to which this poverty mediates the link between women's family time allocation patterns and their subjective well-being.

Although there is some debate regarding the definition of time poverty in academic circles, the more widely accepted definition is based on the United Nations' definition of absolute poverty, the time poverty line can be determined as a multiple of the median labor time for all people. In this paper, with reference to existing studies (Zhang, 2019; Du et al., 2020), the time poverty threshold of 10.20 hours was chosen and an initial median multiplier of 1.2 was calculated. When the values immediately surrounding this multiplier (for example, 1, 1.5, or 2) were separated into work time poverty and household time poverty, it was discovered that the division results had no effect. To put it another way, the concept of time poverty can be satisfied when the multiplier is taken as 1.2, and the degree to which the sample experiences time poverty can be appropriately characterized. As a result, the poverty line used in this study is 1.2 times the median labor time (measured in hours) of the various subsamples.

Figure 2 shows the percentage of time-poor women at work and home, categorized by employment status. Market and domestic work generally contribute to time poverty for some women, but this phenomenon is not yet dominant. On average, women who work full-time are more likely to be time-poor than those who work part-time, with the corresponding percentages of time-poor working women and time-poor houseworkers being 50.59% and 39.49%, respectively. The opposite is true for women who work part-time, with 57.79% being forced to bear the burden of housework, but they are hardly ever time-poor at work. Figure 2 also presents the incidence of time poverty for the husbands corresponding to the 4,743 married women. Although the incidence of time poverty at work is relatively similar for men and women, it shows significant differences in time poverty for housework.

This paper re-estimates the regression model by including the indicator variables of time poverty at work and at home to examine the impact of time poverty on subjective well-being in both genders. The estimated ordered probability coefficients of time poverty on men's and women's well-being are shown in columns (1) and (2) of Table 6. After adjusting for family time allocation patterns and the remaining explanatory factors, the results demonstrate that the relative amount of housework-sharing significantly affects wives' sense of fairness but does not affect husbands. Studies have shown that excessive

and unreasonable housework over a long time can cause individuals to feel a strong sense of unfairness, which in turn weakens their level of happiness (Okulicz-Kozaryn & da Rocha Valente, 2018). The adverse effects of household time poverty tend to be more noticeable for women than men, given that men's domestic work is more flexible and infrequent and has less of an overall impact on their daily lives. Considering that market work also provides specific positive incentive effects on personal growth because it has clear social and market values (Başlevent & Kirmanoğlu, 2017), therefore, over-employment has no negative consequences on the subjective well-being of either gender.
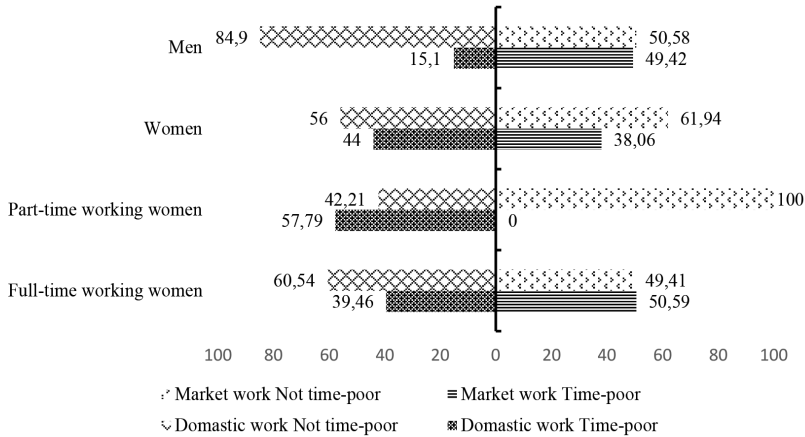

Figure 2. Incidence of time poverty (percentage)

Table 6. Analysis of the effect of time poverty on the happiness of both genders

			Male	Female	
			(1)	(2)	(3)
Impact of time poverty	Market work	In time poverty	−0.055 (0.056)	−0.062 (0.054)	
		Not in time poverty	Reference	Reference	
	Household work	In time poverty	−0.035 (0.079)	−0.184*** (0.055)	
		Not in time poverty	Reference	Reference	
Interaction of time poverty and employment	Full-time employment	Neither in time poverty			Reference
		Market work in, household work not in			−0.140* (0.078)
		Household work in, market labor not in			−0.165* (0.090)
		Both in time poverty			−0.156* (0.092)

End of Table 6

			Male	Female	
			(1)	(2)	(3)
Interaction of time poverty and employment	Part-time employment	Neither in time poverty			0.311*** (0.102)
		Market work in, household work not in			——
		Household work in, market labor not in			0.150 (0.095)
		Both in time poverty			——
Control variables			Yes	Yes	Yes
Urban-rural			Yes	Yes	Yes
Province			Yes	Yes	Yes

Note: Standard errors are given in parentheses. Coefficient estimates are statistically significant at the 10% (*), 5% (**), or 1% (***) levels.

Moreover, we examine how employment and time poverty interact to affect the well-being of women, and the results are displayed in column (3) of Table 6. Women's well-being is much higher when they have enough liberty in time allocation. Women who work full-time and experience time poverty (of any kind) suffer a more extensive loss of well-being than women who work part-time in the same position. When work time poverty and home time poverty are compared in terms of the severity of the penalty they impose on women who work full-time, at the 10% significance level, home time poverty considerably worsens women's well-being more than the combined effect of work and home time poverty. The findings above demonstrate that the incentive effect produced by market labor can somewhat mitigate the detrimental effects of time poverty on women's happiness, and the housework is a significant factor influencing women's happiness. To increase women's overall satisfaction and reduce the time poverty of housework, the next stage in the study is to quantify and cut down on the amount of time spent on housework.

From Table 7, it can be found that women rarely fall into housework time poverty in households where the husband dominates the housework, while the group of women falling into housework time poverty increases significantly in families where the wife dominates the housework or where both spouses share the housework (54.91% and 37.80%, respectively). Further breaking down the happiness level, perceived happiness decreases as the proportion of women in housework time poverty increases. This feature is especially prominent in households where the wife dominates the housework. Among women who were "very unhappy" or "relatively unhappy," the proportion of those who were poor in housework time reached 39.29%, which significantly exceeded the proportion in which the husband and wife shared housework or in which the husband-led housework (0% and 25.76%, respectively).

Table 7. Analysis of the relationship between average housework time and happiness of women under different housework allocation patterns

	Patterns of housework allocation						
	Husband-led		Wife-led			Balanced allocation	
	(1)	(3)	(1)	(2)	(3)	(1)	(3)
Very unhappy	0.00%	–	21.98%	77.50	36.71	25.76%	22.74
Relatively unhappy	0.00%	12.16	17.31%	63.56	23.82	0.00%	18.32
General happy	0.00%	6.94	5.85%	57.69	17.69	4.34%	17.85
Relatively happy	0.00%	6.93	4.65%	54.97	16.14	4.30%	15.74
Very happy	0.00%	6.18	5.12%	54.47	15.74	3.40%	14.86

Note: (1): Percentage of women in household time poverty, (2): Average housework time for women in household poverty, (3): Average time spent on housework by women.

Finally, the happiness effectiveness of women's housework time out of poverty is characterized by a marginal increase. Taking the wife-dominated household model as an example, holding all other conditions constant, when women's happiness leaps from "very unhappy" to "relatively unhappy," their average housework time needs to be reduced by 12.89 hours (13.94 hours in poverty). In contrast, when women's happiness jumps from "relatively happy" to "very happy," their average housework time only needs to be reduced by 0.4 hours (2.72 hours in poverty). When the happiness level is low, the happiness effect of the reduction in women's housework time is low. As the level of happiness increases, the happiness efficacy from reduced housework time also increases. Unfortunately, many women are currently clustered within the area of low happiness, and there is still a need for a significant reduction in women's housework time.

6. Conclusions and implications

The effect of family time allocation patterns on women's well-being has distinct mechanisms of action in different countries. In nations with largely collectivist cultures like those in the East, the effect is inextricably linked to cultural gender norms, gender equality awareness, and the degree of rights protection in society as a whole. Based on the balanced panel data from the CFPS in the three stages of 2014–2018, this study builds a fixed-effect ordered logit model to analyze the impact of family time allocation patterns on married women's subjective well-being by matching sample couples. The study aims to provide Chinese evidence for enhancing women's quality of life and social status and promoting the construction of a gender-equalized civil society.

The following are the paper's primary conclusions: First, unreasonable family time allocation patterns generally harm women's happiness, as evidenced by the fact that women who work full-time and who shoulder most of the domestic duties experience a tremendous loss of happiness. Second, results from subsample regressions indicate that women typically select family time allocation patterns that align with their degree of education, cognitive ability, and overall values. Women with low levels of education and those strongly

constrained by external traditional cultural norms are more suited to the conventional time allocation model, which entails working part-time and handling most household duties. However, market labor significantly worsens the well-being of this group of women than do household duties for the same division of labor. By contrast, for women with high levels of education and self-perception, the division of household duties substantially impacts their well-being and is unrelated to market labor. As a result, the configuration pattern of an equitable distribution of household duties between husband and wife is more important in enhancing these women's well-being.

Additionally, excessive housework considerably lowers women's pleasure levels while having no discernible impact on men. Overemployment does not devalue the well-being of either gender because market labor has a positive incentive effect on personal development. Household time poverty also considerably worsens women's well-being compared to the combined effects of work time poverty and home time poverty. Finally, the happiness efficacy of women's reduced housekeeping time out of poverty exhibits a marginal incremental feature; this happiness efficacy is lower when the happiness level is at a low level and rises as the happiness level increases.

This study indicates three policy implications based on the analysis presented above: First, to increase happiness effectiveness, family members should concentrate on women who work full-time and are primarily in charge of household chores as a time allocation pattern, appropriately raise the percentage of domestic work done by their husbands, decrease women's domestic work time, change the unfair gender relations and gender labor division, and encourage the achievement of a hierarchical leap in women's happiness.

Second, policymakers should investigate time allocation strategies adapted to the myriad traits of various groups of women when considering the best mode of allocation while simultaneously demonstrating greater respect and understanding of women's diversity of choice. For example, the construction of an identical allocation pattern within the family for married women with high educational levels who work should be encouraged. However, for women with low academic levels, society should allow the rationalization and diversification of their allocation patterns and respect the free development of individuals.

Third, gender awareness should be mainstreamed into policy-making, laws, and regulations to improve women's economic and social status. Ensuring women's rights to traditional unpaid caregiving roles and equal employment opportunities is crucial. Meanwhile, it is indispensable to support women in dual-income households in finding better ways to balance their work and family obligations. Policies should enhance women's subjective well-being and economic and social position.

Some limitations are inevitable; therefore, this paper offers suggestions for further investigation. First, this paper only examines China, a highly typical and representative country, for analysis because of its large population and the stark tension between traditional ideas and modern consciousness in Chinese society. Subsequent research can attempt to distinguish groups of women in various cultural contexts to increase the applicability of the results of the present research. Second, this study only makes a preliminary attempt based on a single measure of subjective happiness in the questionnaire, considering that quantifying satisfaction is an extensive topic and that happiness is personal and complex. Future research on data and measuring techniques should address this paper's limitations in more detail. Third, it is impossible to account for every component in a single study owing to the complexity of factors that affect subjective well-being. This work attempts to

adjust for several significant influencing elements in as much as possible based on prior studies, thereby ensuring model simplicity and data accessibility.

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APPENDIX

Table 8. Estimation of fixed-effect ordered logit coefficients after adding control variables in Table 3 (2)–(4)

Control variable	(2)	(3)	(4)
Age	−0.038** (0.016)	−0.043*** (0.016)	−0.032** (0.016)
Squared term of age	0.000** (0.000)	0.000** (0.000)	0.000 (0.000)
Years of education	−0.018*** (0.007)	−0.025*** (0.008)	−0.024*** (0.008)
Natural logarithm of income	0.306*** (0.116)	0.194 (0.118)	0.142 (0.118)
Health Status	0.192*** (0.026)	0.166*** (0.026)	0.153*** (0.026)
Social status	0.241*** (0.026)	0.179*** (0.026)	0.104*** (0.030)
Gender role concept	0.675*** (0.041)	0.466*** (0.042)	0.403*** (0.042)
Relative years of education		0.010 (0.009)	0.010 (0.009)
Relative income level		0.199* (0.118)	0.219* (0.118)
Marital Satisfaction		0.676*** (0.033)	0.626*** (0.033)
Dependent relatives		0.100* (0.057)	0.080 (0.057)
Trust			0.278*** (0.020)
Social pressure			0.001 (0.030)
Income status			0.064** (0.029)

Notes: Standard errors are given in parentheses. Coefficient estimates are statistically significant at the 10% (*), 5% (**), or 1% (***) levels.