



FACULTY
OF SOCIAL
SCIENCES

Master's Programme in Social Scientific Data Analysis

Paid Work, Unpaid Work, and Time Poverty: A Quantitative Analysis of Gender Differences from the 2022 China Family Panel Studies

Author: Yuqing Xiang

Master's Thesis (30 credits ECTS)

August 2026

Supervisor: Dr. Wenqian Xu

Abstract

Gendered time allocation has been widely studied in China, yet research on gender differences in time poverty remains relatively limited. Using individual-level data from the 2022 China Family Panel Studies (CFPS), this thesis examines gender gaps in paid work, unpaid work and total workload among employed adults aged 18–59 in China, and compares the prevalence, depth, severity and composition of time poverty between men and women. Adjusted estimates showed that women’s weekly paid work time was 4.6 hours less than that of men, whereas they spent 9.7 more hours on unpaid work, resulting in an approximately five-hour greater total workload. Under the two time-poverty thresholds adopted in the analysis, women’s adjusted probability of experiencing time poverty was 8.3 and 7.2 percentage points higher, respectively, while their time-poverty depth and severity were also significantly greater. Among the time-poor population, men were relatively more concentrated in the category of excessive paid work alone, while women were more represented in categories involving the accumulation of paid and unpaid work. The gender gap in time poverty was greater among married or cohabiting adults, while the interaction associated with the presence of minor children was not statistically significant under either threshold. By distinguishing different workload configurations, this thesis advances the understanding of how paid and unpaid work combine to shape the gendered patterns of time poverty. These findings highlight the need for policies to address time poverty by targeting both long paid working hours and the unequal distribution of unpaid work within households.

Keywords: Time poverty, Gender differences, Time-use allocation, Paid work, Unpaid work, Workload composition, China

Word count: 19,053

Table of Contents

Abstract	2
Table of Contents	3
List of Tables	5
List of Figures	5
1. Introduction.....	6
1.1 Research background and problem formulation.....	6
1.2 Research aim and questions.....	9
1.3 Overview of the structure	10
2. Literature Review	11
2.1 Conceptualization and measurement paradigms of time poverty.....	11
2.2 Gender and time allocation.....	14
2.3 Gender and time poverty	15
2.4 Research gap.....	17
3. Theoretical Framework.....	19
3.1 The allocation-of-time framework.....	19
3.2 Social reproduction theory.....	21
3.3 Research hypotheses	23
4. Methods	26
4.1 Data source	26
4.2 Sample selection	26
4.3 Operationalisation.....	27
4.3.1 Outcome measures.....	27
4.3.2 Explanatory variables	32
4.3.3 Grouping variables.....	33
4.3.4 Control variables.....	34
4.3.5 Data preprocessing.....	36
4.4 Analytical strategy	37
4.4.1 Descriptive statistics	37
4.4.2 Multivariate analysis.....	38
4.4.3 Type-based exploratory analysis.....	38
4.4.4 Heterogeneity analysis.....	39
4.4.5 Sensitivity analysis	40
4.5 Ethical considerations.....	40
5. Results.....	42
5.1 Descriptive statistics	42
5.1.1 Weighted sample characteristics.....	42
5.1.2 Descriptive gender differences in time-use outcomes	44
5.1.3 Descriptive gender differences in the FGT indices of time poverty.....	44

5.2 Multivariate analysis.....	46
5.2.1 Regression analysis of gender differences in time-use outcomes.....	46
5.2.2 Regression analysis of gender differences in time-poverty prevalence.....	47
5.3 Type-based exploratory analysis.....	47
5.3.1 Time-use composition of the time-poor.....	47
5.3.2 Five-category classification under the 68.4-hour threshold	49
5.3.3 Five-category classification under the weighted P75 threshold	51
5.4 Heterogeneity analysis.....	51
5.4.1 Gender differences in time-poverty prevalence by partnership status.....	52
5.4.2 Gender differences in time-poverty prevalence by the presence of children under 16	53
5.4.3 Gender differences in the FGT indices of time poverty across family contexts.....	53
5.5 Sensitivity analysis	55
6. Discussion	56
6.1 Gendered division of time poverty: paid and unpaid work	56
6.2 Beyond prevalence: depth and severity of time poverty	57
6.3 Family contexts of gendered time poverty: partnership and children	58
6.4 Implications	59
6.5 Limitations and future research	61
7. Conclusion	63
References.....	64
Appendix A. Additional tables for data analysis.....	70
Appendix B. Additional figures for data analysis	73

List of Tables

Table 1. Five-category classification of time-poor respondents by paid and unpaid work time _____	39
Table 2. Weighted sample characteristics by gender (in percentages) _____	42
Table 3. Time-poverty prevalence, gap, and severity by gender (in weighted estimates) _____	46
Table 4. Adjusted gender differences in work time and time poverty (reference: men) _____	46
Table 5. Time-use outcomes among the time-poor (hours per week) _____	49
Table 6. Distribution of the five time-poverty categories by gender and threshold _____	49
Table 7. Family-context heterogeneity in the adjusted gender gap in time-poverty prevalence _____	51

List of Figures

Figure 1. Weighted weekly average hours on time-use outcomes by gender _____	44
Figure 2. Weighted time-poverty prevalence by gender and threshold _____	45
Figure 3. The shares of paid and unpaid work in total workload by gender and threshold _____	48
Figure 4. The distribution of five-category types by gender and threshold _____	50
Figure 5. Adjusted time-poverty prevalence across two family contexts by gender _____	52
Figure 6. Descriptive gender differences in FGT indices of time poverty across family contexts ____	54

1. Introduction

1.1 Research background and problem formulation

Over the last few decades, there have been crucial shifts in China's economy, labour market and family structure in China. Perhaps one of the most notable of these changes is the increasing importance of paid work for people's livelihoods, especially for women, who have increasingly entered salaried and wage employment. The number of women employed in urban work units rose from about 48.6 million in 2010 to 67.8 million in 2020 (National Bureau of Statistics of China, 2021). Given these changes, paid work has become a common livelihoods responsibility for both men and women in China.

At the same time, unpaid labour within families continues to impose considerable demands on people's daily lives (Dong and An, 2015). This issue is especially relevant to employed working-age adults, because they are at the intersection of multiple life responsibilities, such as employment, livelihood, parenting, care for parents and daily household maintenance. In the context of changes in China's population and household structure, the demands of unpaid labour are particularly remarkable. By the end of 2024, people aged 60 and above accounted for 22.0% of the total population, while the average number of families declined from 3.10 persons in 2010 to 2.62 persons in 2020 (National Bureau of Statistics of China, 2021, 2025). The aging population has increased demand of eldercares, while smaller households have also limited the availability of shared informal care within families (Glinskaya and Feng, 2018). Children's care needs also vary across parenting stages and are especially intensive when children are young (Chen, 2024). Additionally, strong educational expectations and fierce academic competition are associated with the fact that many Chinese parents devote a large amount of time and energy to childcare, particularly to their children's learning and education (Du, Dong and Zhang, 2023). Although domestic and care services provided by market can partly substitute for some unpaid household work, its attainment and affordability are constrained by household income and social class (Folbre and Nelson, 2000). In this respect, unpaid labour remains a considerable burden in addition to paid work among working-age adults.

Significantly, these unpaid labour responsibilities within families are not distributed equally in terms of gender. Although more women have entered the sphere of market labour, domestic

duties and division of labour within the family have not also been reallocated in more reasonable way (Dong and An, 2015; Rubiano-Matulevich and Viollaz, 2019). Most unpaid work, including domestic chores, childcare and eldercare, is still primarily carried out by women. According to the third Chinese Time Use Survey, in the field of unpaid labour, women spent an average of 3 hours and 29 minutes per day, clearly higher than 1 hour and 52 minutes of men. By contrast, men spent 49 minutes more per day on paid labour. Meanwhile, the participation rates of men and women were 60.2% and 47.7% in paid labour, and 67.5% and 83.9% in unpaid labour, respectively (National Bureau of Statistics of China, 2024). In this sense, men and women carry different compositions of overall workloads. Men's labour time is more focused on paid employment, whereas women undertake more household work and family care in addition to paid work. In such a context, it seems to be a crucial question of how this gendered workload influences their daily schedules within the limited time.

This gendered structure of labour time allocation matters because time is a finite resource for everyone. Unlike income, everyone equally possesses a fixed 24-hour timeframe, which cannot be created, stored, or expanded. Individuals need to arrange a variety of affairs within the limited time, such as paid work, commuting, domestic work, childcare, study, personal care and leisure. Since these activities share the same time budget, once one of them occupies most of time, individuals' remaining time spending on other activities will decrease (Becker, 1965; Goodin *et al.*, 2005). Scholars have argued that when paid work and unpaid labour together take up much time, relatively flexible activities like rest, leisure and personal care tend to be compressed (Bardasi and Wodon, 2006; Qi and Dong, 2018).

This is where the issue of time poverty becomes significant. In the literature, time poverty has been conceptualised in terms of both perceived time pressure and objective constraints on available time (Szollos, 2009). This study adopts the latter perspective, defining time poverty as a situation in which committed activities, such as employment, domestic work, take up so much time that individuals lack enough time for personal care and leisure (Bardasi and Wodon, 2006). Existing research regarding time use shows that long hours of paid work can contribute to time poverty, while heavy unpaid labour burden can constitute one of the sources of time poverty (Bardasi and Wodon, 2006; Gammage, 2010). Due to more unpaid labour input for employed women alongside paid work, they might sacrifice their available time to maintain a balance between employment and family responsibilities, and may thereby face a higher risk of

time poverty (Arora, 2015; Qi and Dong, 2018). In summary, gender inequality in time use is reflected not only in differences in the allocation of paid and unpaid work, but also in unequal exposure to time poverty.

In the context of China, the phenomenon of time poverty among working-age adults may be correlated with several factors. They include longer commuting time associated with urbanization (Nie and Sousa-Poza, 2018), non-standard working hours in weakly regulated labour market (Cao and Rubin, 2014), and status competition that intensify perceived time scarcity (Zhao et al., 2024). In August 2022, employees of enterprises worked an average of 48.0 hours per week (National Bureau of Statistics of China, 2022). In 2023, 28% of commuters in Beijing commuted more than 60 minutes one way, and in Shanghai, Chongqing, Tianjin, Wuhan and Qingdao more than 15% of commuters fall into this category (China Academy of Urban Planning and Design and Baidu Maps, 2024).

On the other hand, traditional gender norms, marriage and parenthood probably make gender differences in time poverty stand out. The prior literature has clarified that the Confucian patriarchal ideology of “men as breadwinner, women as caregiver” affects women’s earnings, employment opportunities and working hours (Zhang, Wang and Hou, 2024). In addition, compared with the unmarried, married women’s paid-work hours declined, whereas their unpaid care work increased much more than men’s (Dong and An, 2015). Likewise, Dong and An (2015) also found that the presence of children aged 0-6 was associated with an increase in women's unpaid care time.

The existing research has identified gender variances in time poverty among urban workers in China. Qi and Dong (2018) using data from the 2008 China Time-Use Survey, found that the women, married people and low-paid workers accounted for a higher proportion of the time poverty population. Yet, compared with wider international literature, relatively few Chinese studies have connected time allocation with time-poverty outcomes. The early evidence has not fully examined whether the currently employed men and women in China fall into time poverty through different combinations of paid and unpaid work. It also remains unclear whether these differences vary across family contexts. With the changes in China’s family structure and labour market, it is necessary to use the recent data to revisit these questions.

1.2 Research aim and questions

This study's purpose is to empirically investigate the gender difference of time allocation and time poverty among employed working-age adults in China. We pay special attention to analysing the composition of paid-unpaid work time among the time-poor. Additionally, this research further examines whether in specific family contexts these gender differences are stronger or weaker. In sum, this is a study about time-use patterns and time poverty, focusing especially on the perspective of gender differences.

To respond to these questions, the study uses personal dataset from the 2022 China family Panel Studies (CFPS) for quantitative analysis. The available CFPS time-use measures allow this study to examine the objective, workload-based dimension of time poverty through reported time spent on paid and unpaid work. In terms of research object, employed adults aged 18-59 are selected because we focus on how paid and unpaid work jointly occupy limited time resources. Accordingly, this research seeks to answer these research questions:

RQ1:

What are the gender differences in time poverty and in time spent on paid and unpaid work as well as total workload among employed adults aged 18-59 in China?

RQ2:

Among the time-poor, how do combinations of paid and unpaid work differ between men and women?

RQ3:

To what extent do gender differences in time poverty vary by partnership status and the presence of minor children?

Academically, this thesis links gender differences in time allocation to its unequal time resources outcome — time poverty. By investigating how gendered patterns of time use are reflected in time consequences, the study provides further evidence on the gap in time poverty between men and women. Furthermore, by distinguishing different configurations of paid and unpaid work among the time-poor, we examine whether women and men fall into time-poor status through different workload patterns. This provides a more detailed account of the internal

composition of time poverty.

Empirically, this study draws on recent national individual-level data to enrich evidence on time poverty among employed adults in China. The study incorporates both paid work and unpaid work, examining the prevalence, depth and severity of time poverty as well as its internal compositions. Comparisons across partnership status and the presence of minor children further identify whether gender gaps of time poverty vary by household contexts. These analyses provide a comprehensive empirical picture of gendered time poverty in China.

From a practical perspective, this study helps recognize groups at a greater risk of time poverty and clarifies the primary sources of time pressure among men and women. The findings can inform a more balanced policy approach that combines effective working-time regulation with people-centred public support services for care. More broadly, the study encourages policy to move beyond a narrow focus on labour-market participation and to pay more attention to individuals', especially women's overall workload, care responsibilities, and actual access to discretionary time.

1.3 Overview of the structure

The structure of the thesis is as follows. First, Chapter 1 introduces the research topic by situating time poverty within the broader context of gender inequalities among employed working-age adults in China. Based on this discussion, the research questions and aims are formulated. Chapter 2 provides a systematic literature review on time poverty, time allocation, and related empirical studies, and clarifies the research gaps. Chapter 3 establishes the theoretical framework. It draws on allocation-of-time framework and social reproduction theory and presents the research hypotheses. Chapter 4 introduces the dataset, sample selection, operationalisation and analytical strategy. Chapter 5 presents the main empirical results, including descriptive and multivariate analyses, the composition and types of time poverty, heterogeneity across family contexts and sensitivity analyses. Chapter 6 summarizes the key findings, answers the research questions. It also discusses our study's implications and limitations. Finally, the thesis ends with conclusions in Chapter 7.

2. Literature Review

This chapter begins by introducing the conceptualisation of time poverty and its measurement in the existing studies. It then reviews the link between gender, time allocation and time poverty. The final section discusses the research gap.

2.1 Conceptualization and measurement paradigms of time poverty

Traditional measures of poverty have long been dominated by an income-based approach. However, an increasing body of literature has revealed that poverty is fundamentally multidimensional (Alkire and Foster, 2011; Rodgers, 2023). As one crucial non-monetary dimension of poverty, the concept of time poverty traces its roots back to Claire Vickery's (1977) foundational work. Vickery (1977) recognised that relying solely on monetary resources cannot completely assess whether a household reaches a minimum living standard. For households with a similar amount of income, their quality of life tends to differ when household members' available time for market work and household labour varies (Vickery, 1977). She argued that a household's living standard is determined by both its income and the available time required to convert that income into actual consumption (Vickery, 1977). This perspective highlights a critical blind spot in neoclassical economics, namely, households may be income-rich, but time-poor, or vice versa. Consequently, Vickery (1977) proposed a two-dimensional poverty standard incorporating both income and time. Guided by this framework, the follow-up studies found when the household-production time is included in the poverty measurement, the scope of the population identified as time poor expands, particularly for working parents and single-parent families (Douthitt, 2000). In its own right, time scarcity therefore can constitute a form of deprivation. This view directs our attention to employed adults, whose participation in paid work does not necessarily free them from severe constraints on available time.

Based on this foundation, time poverty has gradually developed into an independent and quantifiable form of deprivation. A lack of time can restrict individuals' opportunities for rest, leisure, social participation and personal autonomy (Bittman, 2002; Williams, Masuda and Tallis, 2016; Giurge, Whillans and West, 2020). The research perspective thus has also shifted from family resources to individual time allocation. This shift aligns with time-use research, which segments a 24-hour day into necessary time (for physiological needs, such as sleeping,

eating and drinking), committed time (for market work, unpaid housework and family care) and discretionary time (As, 1978; Goodin *et al.*, 2005). Within this framework, Bardasi and Wodon (2006) then conceptualised time poverty as a state, in which individuals lack discretionary time for relaxation and leisure.

Additionally, Bardasi and Wodon (2010) refined the concept of time poverty in their subsequent research. By incorporating the elements of individual choice and subjective agency, they clarified time poverty as working long hours without having the choice to do otherwise (Bardasi and Wodon, 2010). Under this improved conceptual framework, the double condition standard is adopted to identify the time-poor population. Specifically, a person who works excessively long hours because their household is poor, or would fall into income poverty if they reduced their working time, is classified as genuinely time-poor (Bardasi and Wodon, 2010). Being time-poor is thus a combination of having insufficient time for rest and being unable to reduce work hours without risking income poverty. It helps distinguish individuals who are forced to work prolonged hours under the economic pressure from those who voluntarily take on extra working time for higher income or personal career, with the latter group not classified as the time-poor.

In empirical measurements, there are two main objective approaches to identify the time-poor (Williams, Masuda and Tallis, 2016; Rodgers, 2023). The first one sets a maximum limit on an individual's total committed time. Researchers typically add up the time inputs across market and domestic domains; an individual will be recognised as time-poor if one's total workload exceeds a specified fixed or relative threshold (Wodon and Blackden, 2006). The second approach focuses on an individual's discretionary time. Goodin *et al.*, (2005) distinguish between "actual free time" and "discretionary time". The former simply records time left after actual daily activities, whereas the latter represents the hours individuals genuinely control after deducting the minimum limit that must be spent on basic subsistence (Goodin *et al.*, 2005). On this basis, they argue that only a deficit in discretionary time signals actual time deprivation. Similarly, Kalenkoski, Hamrick and Andrews (2011) deduct non-discretionary activities, such as work, housework, family care and personal care, from the total time of a day or a week. Individuals are recognised as time-poor when their remaining time is below a prescribed threshold. This distinction is particularly relevant to gendered time poverty since a total-workload measure retains the combined involvement of paid and unpaid work, while a discretionary time measure places more emphasis on the amount of available time.

To quantify the time poverty threshold, existing research primarily adopts normative thresholds and relative thresholds. Normative poverty thresholds predetermine fixed standards according to basic living needs. For instance, Vickery (1977) estimates that individuals require at least 81.4 hours per week for sleep, rest, diet, personal hygiene and minimum leisure, and the rest of the time can be used for market and domestic work. Relative time poverty thresholds are instead determined based on the actual time distribution of a certain population, so that an individual's state of time poverty is recognised by comparing with the usual level in the analytical sample. For example, identified time-poor people whose leisure time is below 50% of the median (Bittman, 2002), or whose total work time beyond 1.5 or 2 times the median (Bardasi and Wodon, 2006). Besides, some scholars set multiple thresholds at 50%, 60% and 70% of the median discretionary time respectively to conduct sensitivity checks (Kalenkoski, Hamrick and Andrews, 2011). Although relative thresholds can capture time variations, they risk normalising pervasive overwork in a specific context (Williams, Masuda and Tallis, 2016). To address this limitation, recent studies have adopted a hybrid approach. Qi and Dong (2018) constructed a 68.4-hour weekly threshold by combining a fixed minimum for personal care with a relative minimum for leisure (60% of the median). This indicates that no single threshold provides a definitive identification of time poverty. A normative or fixed threshold facilitates substantive interpretations, whereas a relative threshold captures the position of individuals within a contemporary time-use distribution. In this sense, the choice of thresholds matters because their variations can produce different estimates of profile and scale of time poverty.

However, the headcount ratio can only identify the time-poor but cannot reflect their distance from the poverty line. Foster, Greer and Thorbecke (1984) initially developed decomposable poverty measures (known as the FGT indices) to measure the incidence, depth and severity of income poverty. Bardasi and Wodon (2006) introduced this framework into the study of time poverty. Applied to time poverty, the FGT family distinguishes prevalence (P0), depth (P1) and severity (P2), allowing groups with similar headcount rates but different excess workloads to be compared. Ribeiro and Marinho (2012) subsequently used the FGT indices in their study on Brazil, demonstrating that this measurement framework can compare the intensity of time poverty across population groups.

In addition to the above objective measurements based on time length, another type of study understands the lack of time from the subjective experience of the individual. Szollos (2009)

distinguishes time pressure into objective time shortage and subjective haste. She also pointed out that traditional time logs with activity duration are unable to fully present personal actual experience of time scarcity (Szollos, 2009). Giurge et al.,(2020) further conceptualised time poverty as a persistent feeling of having too many unfinished affairs due to limited available time. Comparison studies also suggest that self-reported objective free time and subjective feelings of being rushed do not always move together, particularly for women (Mattingly and Sayer, 2006). Nevertheless, objective measurement based on actual time allocation is still the mainstream approach in empirical research for its standardized and comparable basis (Rodgers, 2023).

2.2 Gender and time allocation

A major advancement in the studies on time allocation is that researchers have redefined the scope of “work” (As, 1978; Rubiano-Matulevich and Viollaz, 2019). Traditional labour statistics mainly document activities involving paid market participation, while daily labour dedicated to family maintenance has historically been excluded. In contrast, Time-Use Surveys track an individual’s specific activities throughout the day, integrating market and domestic labour into a single 24-hour budget. By doing so, unpaid household work can also be systematically quantified (Reid, 1934; Folbre, 2006). This shift essentially alters the understanding on gender differences in labour. Accompanied by growing evidence from cross-national research, a stable picture of gender disparity has emerged: on average, men spend more time on paid work, whereas women spend significantly more time on domestic and care work (Hook, 2006; Rubiano-Matulevich and Viollaz, 2019).

Over the past decades, rising female employment has been regarded as a crucial shift that can promote an egalitarian division of household work. A considerable body of literature has suggested that women’s time investment in the domestic sphere has decreased, correspondingly, men’s time investment has marginally increased (Bianchi *et al.*, 2000, 2012; Hook, 2006). However, this change is relatively limited in extent. Men’s increased time devoted to household work has not relieved women’s primary burden for it (Hochschild and Machung, 2012). The issue lies in the fact that greater economic resources afford the capacity to reduce one’s own housework burden, but it may not necessarily mean their partners will take over these tasks to the same extent (Bittman *et al.*, 2003; Gupta, 2007). These patterns suggest that gender

inequality concerns not only differences in paid or unpaid work separately but their combined claims on a finite time budget.

The degree of gender differences in total workload varies across social contexts. In many high-income countries, gender gaps in total workload are smaller than differences in the composition of work, and average total working time is similar in some settings (Burda, Hamermesh and Weil, 2013). In many developing regions and countries, including China, the additional unpaid work undertaken by women far outweighs the additional paid work performed by men, resulting in higher total work hours for women (Dong and An, 2015; Rubiano-Matulevich and Viollaz, 2019). Additionally, through three distinct pathways, national and societal circumstances affect time allocation within households. First, public care and basic services determine how much labour must be completed by a household itself. Second, employment structure and working-time institution also change the time allocated to market and domestic activities. The last is that gender ideologies and norms likewise influence whether women's gains in income and education translate into a reallocation of household labour (Fuwa, 2004; Geist, 2005; Hook, 2006).

These gender disparities in time use become more significant after an individual forms a family. Marriage generates ongoing demands on household maintenance and coordination, while parenting increases time-specific activities that cannot be easily postponed. Cross-national time-use studies show that parents have heavier overall work commitments than childless partnered adults, and these additional requirements deepen the gendered divisions between paid and unpaid work (Apps, 2005; Craig and Mullan, 2010). Children's age is important because infants and preschoolers require constant supervision, whereas school-age children shift their parents' time toward transportation, schedules, education and organised activities (Apps, 2005; Craig and Mullan, 2010). Educational attainment introduces further complexity. Higher education raises the opportunity cost of unpaid work and strengthen attachment to employment, but highly educated parents also tend to spend more time on direct childcare (Guryan, Hurst and Kearney, 2008). Therefore, greater economic prospects may reduce certain housework tasks while increasing the time spent on child-centred activities.

2.3 Gender and time poverty

Multiple empirical studies have found that the probability or actual prevalence of experiencing

time poverty is higher for women than for men (Bardasi and Wodon, 2010; Gammage, 2010). Investigations spanning Guinea, Guatemala, Mozambique, the UK and China have consistent findings. Specifically, rather than only displaying a higher likelihood of time poverty, women in these situations experience deeper time deficits (Bardasi and Wodon, 2010; Gammage, 2010; Chatzitheochari and Arber, 2012; Arora, 2015; Qi and Dong, 2018). However, this gendered pattern is not the same across all demographic subgroups. Evidence from South Korea suggests that men have higher overall rates of both subjective and relative time poverty than women (So, 2024). Additionally, subgroup analyses indicate the male disadvantage is heavily concentrated among the full-time employed and the self-employed, whereas women experience greater vulnerability within part-time and non-employed populations (So, 2024). These findings complicate the broader pattern of female disadvantage in time poverty. This suggests that gender patterns appear contingent on employment status, household structure, and the composition of paid and unpaid work. Therefore, gender differences in time poverty should be examined beyond the overall prevalence gap, with concerned with how paid and unpaid work combine and how gender gaps vary across contexts.

The distribution of this deficit is also uneven among time-poor women. Chinese urban research reveals that low-paid, married female workers and women who cohabit with children or elderly people have a higher likelihood of being classified as the time-poor (Qi and Dong, 2018). Similarly, evidence from the United States indicates that never-married women face a lower risk of experiencing such scarcity than the married women, and living with other employed adults can alleviate time stress for certain individuals (Zilanawala, 2016). Whether other adults are available to take on necessary domestic responsibilities within a household is of particular importance. For instance, the prevalence of time poverty among single-parent families in Canada far exceeds that of two-parent households (Harvey and Mukhopadhyay, 2007). In Senegal, the domestic burden on older women significantly decreases once their daughters or daughters-in-law join the household labour force (Marter-Kenyon *et al.*, 2023). These within-group disparities inform that women should not be treated as the same category, since their exposure varies across family circumstances.

Another strand of literature places the focus on the influence of time poverty. Chronic time poverty for rest and personal care not only damages an individual's health, but also impairs one's capacity to pursue education, acquire new skills, apply for a job and engage socially

(Floro, 1995; Wodon and Blackden, 2006; Giurge, Whillans and West, 2020). In low-income families, these impacts also enter the domestic life. Less care time might cause a delay in medical care and reduced food preparation; when a family requires more labour to earn income, daughters' schooling hours may decrease or be suspended to take over their mother's unfinished work (Gammage, 2010). The interviews in Senegal further record that in order to maintain the family's operation, women will reduce their sleeping time, speed up at work and handle multiple tasks at the same time (Marter-Kenyon *et al.*, 2023).

The study of time poverty also found that people lacking time are not in an exactly similar situation. When combining time poverty with income poverty, scholars have distinguished several groups with different alleviation abilities. Some people's income is higher than the income poverty line, and even if they have inadequate time, they may still purchase housework or care services; some people lack time and income at the same time, making it difficult to reduce labour and not having enough resources to replace family affairs. Furthermore, some families are not poor on the surface but fall into income poverty due to the purchase of necessary services (Harvey and Mukhopadhyay, 2007). Canadian research shows that employed single-parent families generally face certain form of time poverty, a considerable part of which is accompanied by insufficient income or alternative service burden; in contrast, most employed two-parent families are neither income-poor nor time-poor (Harvey and Mukhopadhyay, 2007).

2.4 Research gap

Although existing studies have documented gender differences in time poverty, most empirical work primarily compares the prevalence of time poverty or the average labour hours between women and men (Williams, Masuda and Tallis, 2016; Rodgers, 2023). Few studies in China have examined whether gender differences extend to the depth and severity of time poverty or how these differences vary across household contexts. Several questions therefore remain open. Are women disadvantaged only in the probability of becoming time poor, or do they also experience greater depth and severity after crossing the threshold? Are gender differences concentrated among married adults and those living with minor children? More specifically, empirical evidence using updated data to investigate time poverty among employed working-age adults in China remains insufficient.

Moreover, previous studies have adopted variable or single time-poverty thresholds, reducing

the comparability of empirical findings (Williams, Masuda and Tallis, 2016; Rodgers, 2023). Different thresholds may identify time poverty of different scales and compositions, thus, employing multiple thresholds help to assess whether the research results depend on a specific setting.

Another common limitation in prior research lies in its simplified classification among time-poor populations. The existing studies usually treat all individuals exceeding the time-poverty threshold as a homogeneous group (Rodgers, 2023). While this approach effectively identifies time-poor respondents, it cannot distinguish the distinct combinations of labour time among such populations. Individuals with similar total work time may experience particularly long paid work, heavy unpaid work, or the accumulation of both forms of work. From this stance, ignoring these differences might conceal the structural disparities within time-poor people.

3. Theoretical Framework

To examine the gender differences in work-time allocation and time poverty, this study mainly draws on two complementary perspectives, that is the Allocation-of-Time framework (Becker, 1965), and Social Reproduction Theory (Benston, 1969; Bhattacharya, 2017). Both recognise that market work and household production make claims on individuals' labour and time, yet adopt different but interconnected analytical focuses. The former explains the immediate mechanism through which market and non-market activities compete within individuals' finite time budgets, so that their combined demands generate time pressure. The latter contextualises these demands within social organisation, highlighting that paid and unpaid work are institutionally and normatively gendered, with women often absorbing unpaid reproductive labour. Bringing these perspectives together, they link the formation of time pressure to the gendered distribution of the work that produces it. The following sections explicitly elaborate on these theories and formulate the research hypotheses.

3.1 The allocation-of-time framework

Becker (1965) proposed the theory of the allocation of time by integrating the cost of time into the resource allocation of individuals and families. Becker (1965) described the household as a production unit. Households purchase goods from the market and allocate members' time to produce commodities, such as meals, living conditions and childcare (Becker, 1965; Chiappori and Lewbel, 2015). For example, preparing a meal requires inputs of purchased ingredients and cooking time at the same time. Within this framework, time acts as an independent input for household production. The total amount of time that individuals can use is limited, and the time allocated to one activity will reduce the time available to other activities. Market wages further link monetary resources and time: the time spent on market work can generate income, and the time spent within the household can directly contribute to family production (Becker, 1965; Gronau, 1977). This framework thus links commodity demand, labour supply and household production together, establishing an analytical basis for modern time-use research (Chiappori and Lewbel, 2015). This theoretical perspective forms the starting point of the present study. Both paid labour and unpaid reproductive labour require time investments and compete for individuals' fixed time resources. We place the two types of labour into the same time budget to examine how they constitute the daily time allocation among employed adults.

Becker's original model incorporated varied forms of non-market time into home production and did not clearly distinguish home production from leisure. Gronau (1977) refined this aspect, categorising time into three functionally distinct domains: market work, home production and leisure. Home production generates services for household needs through time inputs and the purchase of market goods. Activities such as cooking, cleaning and certain care services fall into this category, and these services can either be produced within a household or acquired through the market (Gronau, 1977). Leisure directly brings utility through personal satisfaction, and its main purpose is not to produce output that can be used within a household (Gronau, 1977; Aguiar and Hurst, 2007). Such a distinction is of value to our study. Less time spent on paid work cannot be regarded as lower labour input, given that part of the non-market time may have been occupied by home production, such as housework and family care. More importantly, home production is labour with productive function and to a degree substitutable value, and thereby cannot be treated as pure leisure (Rapoport, Sofer and Solaz, 2011).

Another contribution of this framework lies in showing how various activities are interconnected and constrained by each other through opportunity costs and replacement relationships. Scholars have argued that everyone has a limited time endowment in a given period, and that wages, non-labour income, family needs and production technology jointly constrain an individual's feasible time distribution (Becker, 1965; Juster and Stafford, 1991). From this stance, this framework does not regard time allocation merely as a matter of personal preference, instead as an outcome shaped by multiple resources and constraints.

However, it cannot fully explain why family responsibilities have been divided along gender lines for a long time. A key limitation of this approach lies in its adoption of the unitary household model, which family members are treated as completely rational "economic agents" (Alderman *et al.*, 1995). Utility-maximising choice based on comparative advantage provides one interpretation of gender difference in the division of labour, but it ignores gender norms within a household (Agarwal, 1997). From this, this perspective places limited attention to the broader social and institutional organisation through which productive and reproductive responsibilities become gendered. In such a context, social reproduction theory offers vital insights for understanding gender gaps in time allocation and time poverty.

3.2 Social reproduction theory

To grasp the underlying structural roots of time poverty, it is essential to integrate empirical time research with Social Reproduction Theory (SRT), a major strand of feminist political economy. In this study, SRT is used as an interpretive or sensitising framework, with the empirical analysis focusing on the dimensions captured by the available time-allocation measures. This theory challenges the single stance of conventional economics that centres on commodity production in the market. Feminist economists argue that the capitalist economy relies parasitically on two interconnected spheres: the sphere of marketed commodity production and the sphere of non-marketed social reproduction (Mitchell, Marston and Katz, 2003; Fraser, 2016; Bhattacharya, 2017). Capitalism relies not only on operations within the companies, factories, and markets, but also on reproductive activities. The latter act as a foundation to sustain the daily and intergenerational continuation of labour power including childcare, caregiving, housework and essential emotional support (Ferguson, 2019). This perspective challenges the narrow notion that work equals paid productive employment (Benston, 1969; Bhattacharya, 2017; Ferguson, 2019). By emphasising that social reproduction is another essential form of labour alongside production, SRT explains why people must dedicate a significant portion of their daily time to these unpaid activities. Consequently, an individual's time allocation across these spheres inherently constitutes a concrete manifestation of the division of labour between social production and social reproduction.

Social reproduction refers to the activities and institutions needed to maintain life, households and labour power. It includes cooking, cleaning, childbirth, taking care of children and the elderly, as well as involves education, medical care, emotional support and intergenerational renewal of the labour force (Bhattacharya, 2017; Ferguson, 2019). The continuing operation of commodity production must depend on the reproduction process that takes place in families, communities and public institutions. It provides basic survival conditions for workers to participate in market work every day and also ensures the cultivation and replacement of next generation of labour (Mitchell, Marston and Katz, 2003; Fraser, 2016; Bhattacharya, 2017). However, there is also a structural contradiction between the two. Market production requires workers to invest more time, while families and society need enough time, services and resources to sustain social reproduction. Given this, within a finite time budget, the demands of both spheres can thereby be difficult to fully meet.

The gendered organisation of social reproduction shapes how labour is allocated across the economic and domestic domains. Within this gendered framework, men and women take on different dimensions of labour responsibilities under the same setting of division of labour. Men are usually given a stronger responsibility for economic supply, and their family contribution is more often expressed through paid employment and breadwinning (Warren, 2003; Kreimer, 2004). Their income supports families' access to food, housing and other living resources, and paid work time constitutes an externalised way of men's maintenance responsibilities. Women are more often regarded as the main person responsible for housework and care (Warren, 2003; Ferguson, 2019). As a result, paid labour and unpaid reproductive labour therefore represent two gendered locations within the same gender-based labour arrangement.

Crucially, capitalist social arrangements can further amplify the gender inequality. The central operating logic of capitalism rests with the facts that it depends on social reproductive capacities, while systemically outsourcing many of their time and even denying undertaking its costs (Fraser, 2016; Bhattacharya, 2017). Capitalism treats this labour as something separate from the economy and the free market. The time and financial cost, therefore, required for social reproduction has not been included in formal economic calculations. It is further regarded as unrewarded and has been shifted to the private field of families and absorbed by individuals themselves (Bhattacharya, 2017). More importantly, this shift is highly gendered. Because responsibilities are organised through gendered norms, women disproportionately absorb their costs through unpaid time (Ferguson, 2019). Women's time is thus seen as a flexible resource used to reconcile the competing demands of market labour and family reproduction.

In light of social reproduction theory, disparities in time allocation can be viewed as a structural issue of labour division within social production and reproduction. That is to say, it reflects how productive and reproductive responsibilities are socially and institutionally organised. Although more women participate in the work of market production, the gender division of labour within families has not undergone corresponding changes. A growing literature provides evidence that women, married working mothers in particular, still take on the majority of housework and caring (Sayer, 2005; Luo and Chui, 2018). Gendered reproductive responsibilities expose working women to the cumulative burden of paid labour and unpaid reproductive labour. Time-use research shows that this dual burden can produce longer total work time among women (Sayer, 2005).

China's market-oriented transformation has aggravated gender disparities in time allocation by shifting a substantial share of care responsibilities towards families and markets (Dong, Joffre and Song, 2022). On the one hand, public investment in areas such as childcare and elderly care has remained insufficient for a long time. Specifically, the shortage of childcare services for infants aged 0-3, together with quite low pension insurance for the rural elderly, turned much of care responsibilities into a private family matter (Dong, Joffre and Song, 2022; Liu, Qi and Xiong, 2022). On the other hand, commercialized elderly care services exhibit clear class differentiation and is more inaccessible to low and middle-income families (Nikolov and Adelman, 2019). As a result, most families tend to rely on "intra-family solutions". In a context where gender norms remain persistent, such reliance implies the further exploitation of women's time (Qi and Dong, 2016).

Social reproduction theory, as a macro-level framework, views the process of social reproduction as one that involves multiple fields such as family, community and public services. Drawing on this theoretical perspective, this research narrows its focus to unpaid reproductive labour within the family, which is most relevant to the research purpose. Accordingly, this study defines unpaid reproductive labour as domestic work and family care. Other forms of reproductive labour that are difficult to quantify, such as emotional support and family coordination, are excluded from the scope of empirical measurement for the subsequent analysis.

3.3 Research hypotheses

Social reproduction theory frames the work of sustaining household livelihood as a gendered distribution of responsibilities. Subject to gender norms, men are assigned the role of primary breadwinners, and participation in market employment serves as an important way for them to meet household economic obligations (Kreimer, 2004; Ferguson, 2019). Accordingly, breadwinner expectations may encourage men to devote more committed time to market work (Warren, 2003; Kreimer, 2004). Existing Chinese time-use research shows that men spend more time on paid work on average than women. This gap remains even as women have broadly entered paid employment (Dong and An, 2015; Qi and Dong, 2018; Du and Zhao, 2025). Based on this, this study proposes:

H1a: Men spend more time on paid work than women.

Social reproduction relies on a series of regular activities such as cooking, cleaning, care and other household tasks. These tasks revolve around the daily needs of family members and are usually exhausting, repetitive and time-sensitive (Bhattacharya, 2017; Ferguson, 2019). However, these responsibilities remain strongly gendered since gender norms attribute these duties more to women. Women's increased participation in paid employment has not been accompanied by an expected change that redistribution of household labour in line with their paid-work input (Sayer, 2005; Luo and Chui, 2018). Chinese research likewise find that women's unpaid care work is significantly higher than men's (Qi and Dong, 2018). This study therefore expects a persistent gender difference in the second dimension of labour-time allocation:

H1b: Women spend more time on unpaid reproductive work than men.

These two expectations move in opposite directions. The direction of the total working time consisting of these two types of labour therefore depends on the relative size of the paid-labour and unpaid-labour gaps. Evidence from the 2008 China Time Use Survey shows that women's additional investment in unpaid care exceeded men's additional paid labour. After controlling for personal characteristics and regional differences, women's total working hours per week were 7 hours per week higher in rural areas and 10.5 hours higher in urban areas than men's (Dong and An, 2015). Women's lower average paid-work time compared with men can thus coexist with a greater total labour time once unpaid reproductive labour is included. On this basis, the study expects women to carry the heavier combined burden:

H1c: Women have a greater total workload than men.

Paid labour and unpaid work draw on the same finite day. As their total time rises, the time for rest, personal care and discretionary activities will decrease (Sayer, 2005; Williams, Masuda and Tallis, 2016). Women face particularly high pressure when employment is combined with family responsibilities that are difficult to postpone or transfer. Qi and Dong (2018) found that after considering wages, household characteristics and local-market conditions, women workers were more likely than men to be time-poor (Qi and Dong, 2018). The expected gender gap remains in time poverty from the above evidence:

H2: Women are more likely than men to experience time poverty.

Partnership status and parenthood provide specific contexts for these time pressures. Marriage or cohabitation creates continuous demands for housework, household coordination, and support between partners. The research on marriage shows that partnering increases housework time, and women take on more daily and repetitive tasks (Borra, Browning and Sevilla, 2021). In China, marriage is associated with a high risk of time poverty, and the time gap between men and women in housework will also widen with the life course (Luo and Chui, 2018). Additionally, Chinese longitudinal research shows that childbirth significantly increases the mother's housework time and reduces the father's investment. The gap is most remarkable in the preschool stage of children (Chen, 2024). Therefore, this study proposes:

H3a: The gender gap of time poverty is greater among married or cohabiting adults than among unmarried adults.

H3b: The gender gap of time poverty is greater in the group with minor children than among those without minor children.

Further, the same time-poverty status can arise from different combinations of labour. Some people might cross the threshold through extremely long paid work, while others may do so through exceptionally long unpaid work or accumulate both forms at the same time (Williams, Masuda and Tallis, 2016). Established gender differences in paid and unpaid work suggest that these labour compositions may also differ between time-poor women and men (Dong and An, 2015). The existing literature and theoretical framework have yet to clearly differentiate the precise categories of paid-unpaid combinations within the time-poor group. Accordingly, this aspect is examined using an exploratory approach.

4. Methods

This chapter first describes the data source and sample-selection process used in this thesis. It then explains the operationalisation of the main variables and the data-cleaning procedures. Finally, it presents the statistical strategies used to analyse gender differences.

4.1 Data source

This study uses the 2022 wave of the China Family Panel Studies (CFPS) as the primary data source (Institute of Social Science Survey, Peking University, 2015). The CFPS is a large-scale, nearly nationwide longitudinal tracking survey, which is designed and administered by the Institute of Social Science Survey (ISSS) at Peking University. It collects longitudinal data at the individual, family and community levels and covers a wide range of topics involving employment, education, family structure, population migration, income and health. From the year of 2010, baseline interviews were formally launched across the nation, and the sample covered 25 provinces, autonomous regions and municipalities. The baseline sample employed multi-stage probability sampling proportional to size (PPS). Then, in principle, follow-up tracking surveys have been conducted every two years for baseline household members and newly eligible members who meet the survey criteria (Xie and Hu, 2014).

The personal dataset from the CFPS is utilised for our analysis. The data in 2022 wave is the latest version of the CFPS public dataset that can be obtained at the time of analysis. Although the CFPS is not designed for a specialised time-use survey, its questionnaire involves a variety of time-use questions such as working time for the main job, commuting time to work, housework time and time spent taking care of their family members. Besides, this dataset also provides a range of sociodemographic characteristics including age, sex, ethnicity, income, educational attainment, marital status, number of children and employment status (Institute of Social Science Survey, Peking University, 2015).

4.2 Sample selection

All the analyses performed were built on the 2022 individual-level CFPS dataset. The analytical sample was first targeted at all respondents aged 18-59 to apply a common adult age range for men and women. Then we retained respondents who were working in the labour market at the time of the survey.

The restriction in age range reflects the thesis's focus on adults in the principal phase of labour-market participation. Individuals under 18 years are mostly in the phase of being educated or having not yet completely entered the labour market, and regularly do not participate in the formal workforce. On the other hand, elderly people face an increasing likelihood of withdrawing from the labour market. In addition, we further screened the sample who were currently classified as employed, that is, the composite employment-status variable $EMPLOY = 1$ in the CFPS. This category includes respondents engaged in agricultural work, wage employment, self-employment and private business. For the unemployed or outside the labour market, the questions about paid working time or commuting time were usually not applicable, and the nature of their time constraints may also differ from that of employed people.

After applying the age and employment restrictions, 13,609 respondents remained eligible for the subsequent data preprocessing (see section 4.3.5 for details). The final analytical sample comprises 10,642 respondents, including 5,956 men and 4,686 women. The specific demographic characteristics of the sample are reported in the descriptive analysis in Chapter 5.

4.3 Operationalisation

4.3.1 Outcome measures

The outcome measures followed a sequential construction process. Paid work time (P_i) and unpaid work time (U_i) were first constructed from relevant CFPS time-use items and expressed in hours per week. Total workload (T_i) was then calculated as the sum of paid and unpaid work time. The individual-level time-poverty indicator (TP_i) was created by comparing total workload with each of the two pre-specified thresholds (z_1) and (z_2), while the FGT indices P_0 , P_1 and P_2 summarised the incidence, depth and severity of time poverty at the group level. Paid work time, unpaid work time and total workload were therefore examined both as outcome variables and as the components from which time poverty was constructed.

Time poverty

(1) Individual-level identification of time poverty

Two common objective approaches have been employed to identify time poverty in previous studies. The first compares an individual's total work time with a pre-specified time-poverty threshold (Bardasi and Wodon, 2010), while the second compares the discretionary time with a

corresponding threshold (Goodin *et al.*, 2005). However, we cannot directly calculate an individual's discretionary time by deducting actual sleeping, personal care and leisure time, because the information is not provided sufficiently in the CFPS. In comparison, it provides the work-related time, housework time and family care time, which contribute to estimating the total workload. Therefore, the total-workload approach is a preferable starting point.

Under this approach, the time-poverty threshold (z) signifies the maximum weekly time that a person can spend on paid and unpaid work after meeting the minimum personal care and leisure needs. Based on this, both thresholds were applied to compare with the same individual total-workload (T_i , which was constructed in the later section) and used throughout the main analyses. Descriptive statistics, regression models and subgroup and interaction analyses were conducted separately under each threshold, and the two sets of results were reported in parallel.

An individual is classified as time poor if their total workload exceeds the relevant threshold:

$$TP_i = \begin{cases} 1, & T_i > z \\ 0, & T_i \leq z \end{cases}$$

where ($TP_i = 1$) indicates that individual (i) is classified as time poor and ($TP_i = 0$) indicates that the individual is not classified as time poor.

(2) Time poverty thresholds

Because there is no universal time-poverty threshold, this study adopted two thresholds to reduce the sensitivity of the results to a single choice (Bardasi and Wodon, 2006; Kalenkoski, Hamrick and Andrews, 2011; Qi and Dong, 2018). The first is a threshold previously used to examine time poverty among urban Chinese workers, which contributed to ensuring comparability with existing research in China. The second is a sample-specific threshold calculated from the weighted total-workload distribution of the present analytical sample.

The threshold of 68.4 hours per week was adopted by Qi and Dong (2018) in their research on time poverty among urban workers in China. This line was obtained by deducting 84 hours for minimum personal care time and 15.6 hours for minimum leisure time from a total of 168 hours a week. The personal care time covered eight hours of sleep and four hours for eating, drinking and personal hygiene per day, and 15.6 hours was 60% of the median weekly leisure time of their sample. Accordingly, the first threshold, referred to as the literature-based threshold, was defined as:

$$z_1 = 68.4 \text{ hours per week}$$

The other was determined from the actual total-workload distribution of the analytical sample. Existing studies have adopted various relative thresholds to identify the time-poor, including 50%, 60% and 70% of median discretionary time, 1.5 times median total work time and selected percentiles of the total-work-time distribution (Bardasi and Wodon, 2006; Kalenkoski, Hamrick and Andrews, 2011; Srivastava and Floro, 2017). Srivastava and Floro (2017), for example, used the 75th percentile of the total-work-hours distribution as a moderately time-squeezed threshold. In light of this, we used the weighted 75th percentile of the total workload distribution as the second time-poverty threshold based on the 2022 CFPS individual cross-sectional survey weight. The second threshold, referred to as the sample-relative threshold, was defined as:

$$z_2 = Q_{0.75}^w(T)$$

(3) Group-level FGT indices

Although the binary indicator $[TP_i]$ can identify whether an individual is time poor, it cannot reflect the specific extent of a person's time poverty. To address this limitation, the study employed the Foster–Greer–Thorbecke (FGT) class of poverty indices (Foster, Greer and Thorbecke, 1984), which has been applied in prior time-poverty studies (Wodon and Blackden, 2006; Arora, 2015). Unlike the individual-level variable (T_i) , the FGT indices are group-level measures by summarising the data of multiple individuals in a group, which were used for descriptive and subgroup comparisons in this study.

Within the FGT framework, the incidence, depth and severity of time poverty are represented by a unified equation below:

$$P_\alpha = \frac{\sum_{i: T_i > z} \omega_i \cdot \left(\frac{T_i - z}{z} \right)^\alpha}{\sum_i \omega_i}, \quad \alpha = 0, 1, 2$$

where (ω_i) refers to the individual cross-sectional survey weight from the 2022 CFPS, (T_i) denotes the individual's total workload, and (z) stands for either the literature-based threshold (z_1) or the sample-relative threshold (z_2) . Only individuals whose total workload exceeds the threshold (z) are included in the numerator, while non-time-poor individuals contribute zero to the index value.

When $\alpha = 0$, P_0 is the weighted headcount ratio measuring time poverty incidence. The range is from 0 to 1, and the higher this value, the higher the proportion of the population in this group experiencing time poverty. When $\alpha = 1$, P_1 represents the normalised time-poverty gap measuring average poverty depth, defined as the weighted average normalised excess workload across the entire group, with non-time-poor individuals contributing zero. When $\alpha = 2$, P_2 is the squared normalised time-poverty gap, which assigns higher weight to the larger time poverty gap. This index is especially sensitive to individuals whose total workload significantly exceeds the time-poverty line (Foster, Greer and Thorbecke, 1984; Wodon and Blackden, 2006). The three indices were calculated separately using z_1 and z_2 .

Paid work time

When measuring the time workers invest in market employment, previous time-use studies have not only considered working time in the workplace, but also incorporated commuting time required for work into employment-related time. For example, Qi and Dong (2018) clearly included commuting time when measuring actual paid working time among urban workers in China. Based on this, the present study defines paid work time as the sum of weekly working hours and estimated weekly commuting hours

In the questionnaire, all the employed respondents (EMPLOY = 1) were asked about hours per week spent on the main job (QG6 in CFPS). The question is: *“Excluding lunch break, but including paid or unpaid extra working hours, how many hours per week on average did you work for this job in the past 12 months?”* The original unit is hours/week with values ranging from 0.1 to 168 hours.

Commuting time is measured using QG3011. First, the respondents were asked about the current place of their work (QG301), then for respondents with a fixed workplace, further asked *“In general, how many minutes do you spend on commuting to work (one way)?”* and the value ranges from 0 to 240 minutes (QG3011). Respondents who lived in the workplace were recorded as 0 for this question, and those who did not have a fixed workplace did not answer this question according to the skip logic. Since the survey has no follow-up question about actual commuting days per week, commuting time is estimated by assuming one round trip per working day and five working days a week: $C_i = \frac{G3011_i \cdot 2 \cdot 5}{60}$

Where (G3011_i) represents the one-way commuting time reported by individual (i), measured in minutes, and (C_i) is the estimated weekly commuting time, measured in hours.

Paid work time is then calculated as: $P_i = W_i + C_i$

Among them, (W_i) denotes weekly working hours, and (C_i) denotes estimated weekly commuting hours. A higher value of (P_i) indicates that an individual devotes more time to paid work and its accompanying commuting time. For respondents without a fixed workplace or with missing commuting information in QG3011, the specific handling is explained in the data preprocessing section.

Unpaid work time

Unpaid work in the thesis refers to the reproductive labour that an individual invests in maintaining daily household life and meeting care requirements for family members, and they do not receive quantifiable market payment. Following Qi and Dong (2018), housework time and family care time were combined to construct the unpaid work time variable. The empirical measurement was limited to the housework and family care activities explicitly covered by the CFPS questionnaire. The other forms of family-related labour, such as emotional support, household planning or potential mental labour that are hard to quantify by time-use questions, are not taken into account.

Regarding housework time, there are two alternative question paths in the CFPS depending on whether respondents distinguish between workdays and days off in their daily schedule. For the respondents who do not make this distinction, the question (Q9010N) is “*Excluding the time of taking care of family members, in general, how long do you spend on your own housework every day? (range from 0 to 24 hours)*” For those who make a distinction, they were asked separately about their usual daily housework time on workdays (Q9011N) and non-workdays (Q9012). The housework listed in this question explicitly excludes family care, but includes activities such as shopping, cooking and washing dishes, ironing clothes and cleaning the room. Respondents who did not engage in housework were assigned a value of zero.

Housework time is uniformly converted into hours per week as follows:

$$H_i = \begin{cases} 7 \cdot Q9010N_i, & \text{if workdays and days off are not distinguished} \\ 5 \cdot Q9011N_i + 2 \cdot Q9012_i, & \text{if workdays and days off are distinguished} \end{cases}$$

The second calculation assumes five workdays and two non-workdays per week.

Family care time is measured using QQ9012N, which asks “*Generally, how many hours do you*

spend taking care of your families every day?” Responses are recorded in hours per day. Under the questionnaire skip logic, respondents living in single-person households were not asked this question. These cases were coded as structural zeros.

Weekly family care time is calculated as: $F_i = 7 \cdot \text{QQ9012}N_i$

Ultimately, unpaid work time is measured as: $U_i = H_i + F_i$

where (H_i) denotes weekly housework time and (F_i) denotes weekly family care time.

Total workload

In most time-use research, an individual’s total work time has often been obtained by adding paid work time and unpaid work time (Bardasi and Wodon, 2010; Qi and Dong, 2018). The same approach is adopted:

$$T_i = P_i + U_i$$

Where (P_i) denotes weekly paid work time and (U_i) denotes weekly unpaid work time.

Due to item-by-item retrospective questions adopted by the CFPS, (T_i) is an approximate measure of respondents’ total workload. It should not be interpreted as an accurate allocation of mutually exclusive clock time, since activities performed simultaneously may be recorded in more than one component (Floro and Miles, 2003). A higher value of (T_i) indicates a heavier combined work burden of employment and household reproduction.

4.3.2 Explanatory variables

Sex is treated as the focal explanatory variable. The analysis examined differences between men and women in paid work time, unpaid work time, total workload and time poverty in terms of incidence, depth and severity. Due to the cross-sectional observational data employed in the study, the estimates were interpreted as group differences between men and women.

In the original CFPS questionnaire, this item was labelled “Gender” and coded “1” for male and “0” for female. In the present analysis, this binary measure is referred to as sex. To facilitate the results interpretation, the variable was recoded as “1” for women and “0” for men, with men serving as the reference category. For the outcome variables measured in hours per week, a positive coefficient on the women indicator means that the corresponding values reported by

women are higher than those of men, whereas a negative coefficient indicates the opposite. For models using the binary time-poverty indicator (TP_i), a positive coefficient indicates that women have a higher estimated likelihood of being classified as time poor than men.

Descriptive analyses reported all time-use outcomes and time-poverty measures separately for women and men. In the regression models, the prevalence of time poverty was also estimated between men and women. Meanwhile, interaction terms between the female indicator and partnership status or the presence of children under 16 were used to examine whether gender gaps vary across family circumstances.

4.3.3 Grouping variables

Time-use research has identified that marital or partnership status and parenthood as vital life-course conditions are correlated with gendered time allocation between market labour and unpaid labour (Bianchi *et al.*, 2000; Zhang, Wang and Hou, 2024). Cross-national evidence shows that parenthood, in particular, is usually accompanied by an increase in women's share of unpaid work and a decrease in their contribution to paid work, whereas men's adjustment is generally smaller or displays different patterns (Anxo *et al.*, 2011; Yavorsky, Kamp Dush and Schoppe-Sullivan, 2015). Drawing on this literature, partnership status and the presence of children were specified as dimensions for our heterogeneity analysis. In the subsequent analyses, two interaction terms between male/female indicator and each binary variable were constructed to test whether gender disparities in time-poverty incidence vary across these family circumstances.

Partnership status

The marital-status variables contained five categories in the dataset: (1) Never married; (2) Married (having a spouse); (3) Cohabitation; (4) Divorce; (5) Widowed. In time-use research, scholars have grouped married and cohabiting respondents as partnered and compared them with respondents who were not currently partnered, including those who were never married, divorced or widowed (Rubiano-Matulevich and Viollaz, 2019). Accordingly, this variable was recoded into a dummy indicator: 1 = partnered ; 0 = unpartnered, with the latter serving as the reference category. The distribution of each category was reported in the descriptive statistics.

Presence of children under 16

The presence of children is associated with greater commitments to housework, caregiving and educational support. Yet, these time demands vary across children's age cohorts, with younger children usually requiring more care time (Craig and Mullan, 2010). Scholars have used various age ranges to identify children relevant to parental time allocation, such as children under age 10, under age 14, or under age 18 (Jessen *et al.*, 2022; López-Chávez and Ortiz-Ávila, 2024; Zhang, Wang and Hou, 2024). The selected specific demarcations are usually anchored in the variables available in the survey and caregiving demands that the researcher is concerned about.

The variable Child16n in the dataset is available for our analyses. This variable was generated by the family member roster and recorded the concrete number of respondents' children under 16 years old at the time of the survey. A value of 0 indicates that no child under age 16 was recorded. Given that the variable Child16n in the dataset is continuous, we recoded it into a dummy indicator for the group heterogeneity analysis. Hence, the original variable is recoded as 1 = having children under 16; 0 = having no children under 16, with the latter set as the reference category.

4.3.4 Control variables

Prior literature has suggested that an individual's socio-demographic factors such as age, education, economic resources, family structure and marriage are likely associated with time poverty and time allocation (Dong and An, 2015; Qi and Dong, 2018). Some researchers have also taken health status, place of residence and employment sectors into account when evaluating time allocation and time poverty (Bardasi and Wodon, 2010; Srivastava and Floro, 2017). Grounded in such evidence, several socio-demographic features were included as control variables in the analyses. Notably, partnership status and presence of children under 16 were also included in the adjusted model, which have been explained in the above section.

Age is one of the most common control variables in time-use research. Participation in paid work and family responsibilities change across the life course stages, and relevant studies thereby usually incorporate age into their model (Williams, Masuda and Tallis, 2016; Qi and Dong, 2018). Qi and Dong (2018) have divided workers into age groups and found that compared with women aged 15-24, the likelihood of experiencing time poverty was primarily concentrated during the 25-54 age stage, when they bore a greater burden of both work and family responsibilities. Thus, the continuous variable of age generated by the dataset was

directly employed in the models for this study.

Level of education is related to individuals' opportunity to access jobs and employment positions, and also reflects some of the socio-economic resources available to them in the labour market (Becker, 1965). Researchers have found that education is correlated with the time gaps in paid and unpaid work (Zhai, Gao and Wang, 2020). Educational attainment is measured by respondents' highest level of education; the raw variable (ED_UPDATE) consists of multiple categories coded as follows: (0) Illiterate /semi-literate; (3) Primary School; (4) Junior high school; (5) Senior high school/Vocational School; (6) 3-Year College; (7) 4-year college/Bachelor's degree; (8) Master's degree; (9) Doctoral degree; (10) Never been to school. Since these values do not represent equal intervals, this paper regrouped this variable into three tiers: 1 = primary education or below (reference category); 2 = secondary education; 3 = higher education. In detail, primary education or below covers codes 0, 3 and 10; secondary education corresponds to codes 4 and 5, and higher education includes 6 through 9.

Household registration type (Hukou) defines respondents' official registration status within China's hukou system, which is related to population mobility and access to public welfare (Chan and Buckingham, 2008). The urban-rural hukou categorisation serves as a key institutional context for gaps in paid and unpaid-work patterns across Chinese families (Chan and Buckingham, 2008). The variable QA301 in the dataset contains five responses: (1) agricultural hukou; (3) non-agricultural hukou; (5) no registered hukou; (7) residential hukou, and (9) not applicable. The analysis retained codes 1, 3 and 7, while codes 5 and 9 were treated as missing. Agricultural hukou serves as the reference category.

Work type is another characteristic that is commonly included in time-use models to account for variations in job arrangement and economic sectors (Bardasi and Wodon, 2010; Qi and Dong, 2018). In the questionnaire, the main work type (JOBCLASS_base) is generated by questions GC202 and GC2021. Respondents are divided into four categories: (1) family agricultural work; (2) individual/private business/other self-employment; (3) agricultural work for other families; (4) non-agricultural work. This variable (JOBCLASS_base) was directly incorporated in the regression models, and non- agricultural work acts as the reference category.

Health is also a control variable commonly incorporated in time-use and economic well-being models. Individuals' health conditions can restrict or shape their time allocation capacities and

energy across market and domestic domains (Idler and Benyamini, 1997). In the questionnaire, this dimension is recorded by the variable QP201, which measures subjective health perceptions. Respondents were asked a question: *“How would you rate your health status?”* The answers were coded as a 5-point Likert scale: (1) Excellent; (2) Very good; (3) Good; (4) Fair; and (5) Poor. We incorporated this measurement as a categorical variable, with “Excellent” designated as the reference category.

4.3.5 Data preprocessing

At the data pre-processing stage, this study first differentiated the missing variables on the basis of the actual answers of respondents and skip logic of the survey. Specifically, we distinguished between valid reported zeros, structural zeros, and ordinary missing values for time-related variables. Among them, all self-reported zeros are preserved. The structural zeros refer to the fact that the time-related variables were marked as zero in our study, even though respondents were not asked a question due to skip logic. For instance, the family-care question(QQ9012N) was skipped when the respondent was the only member recorded in the family roster; these cases thus were treated as structural zero for this variable. Only special codes such as “Refuse to answer”, “I don't know”, or otherwise invalid numbers, were collectively recoded as ordinary missing values.

In addition, multiple imputation (MI) was adopted to fill in the time-related missing variables. The validity of multiple imputation depends on adequate observed predictors and appropriate model specification (White, Royston and Wood, 2011). Before this, the absence of all the basic items that construct paid and unpaid-work time variables was checked. In detail, cases where both paid work time and commuting time were missing ($N = 999$), as well as cases where both housework time and family-care time were missing ($N = 991$), were excluded from the analytical sample; 867 cases overlapped between the two groups (1,123 unique cases in total). Imputing a completely missing component of paid or unpaid work would rely largely on the imputation model, with limited grounding in observed time-use data. Furthermore, 1,652 respondents without a valid individual cross-sectional weight and 192 respondents with missing values in the control variables were excluded. Consequently, the final analytical sample comprises 10,642 respondents.

When only one component of paid or unpaid work time was missing, multiple imputation was used. Working time, commuting time, housework time and family care time have right-skewed distributions. Predictive Mean Matching (PMM) was therefore used to impute these variables. This method selects observed donor values with similar predicted means, so that imputed values remain within the reasonable range of the original sample (Van Buuren and Groothuis-Oudshoorn, 2011). Compared with complete-case deletion, it also allows researchers to avoid the loss of sample and selective deviation (Sterne *et al.*, 2009).

The imputation model incorporated observed predictors, including sex, age, education level, partnership status, presence of children under 16, household registration, work type, health and other available time-use variables. Ultimately, five imputation datasets were generated, each with 15 iterations. The convergence and plausibility of the model were also evaluated by examining the iteration trajectories and the distribution of imputation values (see Appendix Figures B1 and B2).

4.4 Analytical strategy

Except for cleaning of the original variables, variables construction and multiple imputation, individual cross-sectional weights provided by the CFPS 2022 were used throughout the analyses, including the calculation of the sample-relative threshold, descriptive statistics, FGT indices, regression analysis, time-poverty composition analysis, heterogeneity analysis and sensitivity checks. The regression results are interpreted as gender differences after considering the mentioned control variables.

Unless otherwise stated, each analysis was conducted separately in the five imputed datasets. In accordance with the previously defined operationalisation, paid work time, unpaid work time and total workload were calculated separately within each imputed dataset. Within each imputed dataset, the weighted sample-relative threshold (z_2) was recalculated based on the distribution of total workload. The resulting estimates and variances were combined using Rubin's rules (Rubin, 1987).

4.4.1 Descriptive statistics

First, descriptive statistics are presented to summarize basic characteristics of the full sample, as well as male and female sub-samples. Age, the only continuous variable, was reported in

weighted mean and standard error and the gender difference was examined via weighted mean difference tests. Categorical variables were presented by weighted proportion, and their gender differences were examined using weighted Rao–Scott chi-square tests (Rao and Scott, 1984).

Next, we compared paid work time, unpaid work time and total workload between men and women. Weighted means, standard errors, female–male differences and 95% confidence intervals were reported. For measurement of time poverty, we calculated three FGT indicators (P_0 , P_1 and P_2) under two distinct time-poverty thresholds (z_1 and z_2) respectively. The three indices are reported for the full sample and separately for women and men, together with the corresponding female–male differences.

4.4.2 Multivariate analysis

Before the regression analysis, variance inflation factor (VIF) was used to check for potential multiple co-linear relationships between explanatory variables and control variables.

Survey-weighted linear regression models are estimated for the three continuous outcome variables: paid work time, unpaid work time and total workload. Each model includes the female indicator, age, education level, partnership status, the presence of children under age 16, hukou type, main work type and self-rated health. The coefficient for the female indicator represents the adjusted average weekly difference between men and women in the corresponding time outcome.

For the binary indicator of whether an individual is classified as time poor, survey-weighted Logit models were implemented separately under the two thresholds. Average marginal effects (AMEs) were reported for interpretation. AMEs is capable of capturing the average percentage-point difference between men and women in the predicted probability of being classified as time poor after considering the observed control variables. Odds ratios(OR) and their 95% confidence intervals are reported as supplementary results.

4.4.3 Type-based exploratory analysis

To examine the various patterns of time poverty, the analytical sample only in this part was restricted to respondents whose total workload exceeded the corresponding time-poverty threshold. We first compared weighted mean paid work time, unpaid work time and total workload between time-poor women and men. Then, the respective shares of paid and unpaid

work in total workload were further calculated, to ensure the comparison for individuals with different levels of total workload.

In addition, we investigated the composition of paid-unpaid work time among time-poor respondents, performed separately under the two time-poverty thresholds. Based on whether paid and unpaid work independently exceeded the corresponding threshold, all time-poor respondents were classified into five types. These types are mutually exclusive and exhaustive. This deductive classification was adopted to describe the distinct combinations of paid-unpaid workloads within the time-poor population. The weighted proportion of each type was calculated separately for women and men. Female–male differences and their 95% confidence intervals were reported when the smaller gender-specific cell contained at least 30 observations in every imputed dataset.

Table 1. Five-category classification of time-poor respondents by paid and unpaid work time

Category	Criteria	Interpretation
Paid-work excess	$P_i > z, U_i \leq z$	Paid work alone exceeds the time-poverty threshold.
Unpaid-work excess	$U_i > z, P_i \leq z$	Unpaid work alone exceeds the time-poverty threshold.
Dual excess	$P_i > z, U_i > z$	Paid and unpaid work each independently exceed the threshold.
Cumulative: paid-dominant	$P_i \leq z, U_i \leq z, T_i > z, P_i > U_i$	Neither work alone exceeds the threshold, but total workload does, with paid work as the larger share.
Cumulative: unpaid-dominant	$P_i \leq z, U_i \leq z, T_i > z, U_i \geq P_i$	Neither work alone exceeds the threshold, but total workload does, with unpaid work as the larger share.

Note: P_i = paid work time; U_i = unpaid work time; T_i = total workload; z = time-poverty threshold

4.4.4 Heterogeneity analysis

For heterogeneity analysis, two interaction terms (the female indicator by partnership status and the female indicator by the presence of children under 16) were respectively incorporated into logit models of the full sample for the binary time-poverty indicators. The models retained the remaining control variables, including age, education level, hukou type, work type, health and

the other family-context variable.

Given that interaction effects in a nonlinear model cannot be directly inferred by the coefficient of product terms, we primarily interpreted results based on predicted probabilities and between-group probability differences and differences between these gaps (Ai and Norton, 2003). The female-male probabilities difference was estimated for each of the two household dimensions: partnered-unpartnered status, and the presence-absence of children under 16. The difference between the two gender gaps was then calculated within each dimension. As supplementary descriptive analysis, the FGT indices of time poverty were also calculated for women and men within the two family-context separately.

4.4.5 Sensitivity analysis

Furthermore, we carried out robustness checks in multiple approaches. First, we excluded workers without fixed work locations (who had missing commuting data) to reconstruct the variable of paid working time and re-estimate main regression models. Next, robustness was further verified by contrasting estimates from multiple imputation datasets and a complete-case sample. Besides, we dropped extreme observations where total weekly workload exceeded 168 hours and repeated the core analytical procedures to check result stability. Last but not least, although income is correlated with time poverty (Qi and Dong, 2018), it was excluded from our main regression models because the available personal income measure primarily records wage and salary earnings. As an extra robustness check, log wage income was integrated into the models estimated within the sub-sample of waged employees.

4.5 Ethical considerations

This study uses the 2022 public dataset of the China Family Panel Studies (CFPS), which is de-identified secondary data. Informed consent was obtained from respondents prior to each wave of formal interviews and the ethical approval for the CFPS was granted by the Peking University Biomedical Institutional Review Board, with approval number IRB00001052-14010. To protect respondents' privacy, the CFPS removed identifiable details such as full names, addresses below the provincial level and workplace information from public datasets. At the same time, highly sensitive information is stored in restricted-access archives (Institute of Social Science Survey, Peking University, 2015). Accordingly, this study only conducts statistical analysis within the scope allowed by public data.

5. Results

This chapter presents the major results of data analysis on gender differences in time allocation and time poverty among employed adults aged 18-59 in China. The results consist of five sections. Descriptive statistics for weighted full-sample profiles as well as gender subsamples are presented in the first section. We also display gender differences in each time-use outcome as well as in prevalence, depth and severity of time poverty. Next, we examine whether those differences persisted after adjustment using weighted OLS and logistic models. In the third section, we look more closely at respondents who were already time poor, first comparing the time-use indicators, and the five mutually exclusive types of time poverty are then distinguished. Moreover, models with interaction terms were used to test whether adjusted gender gaps varied by partnership status and presence of children under age 16. In the last section, we evaluate the stability of the main results by several sensitivity analyses.

5.1 Descriptive statistics

5.1.1 Weighted sample characteristics

The descriptive statistics are organized around an investigation of gender disparities in the full analytical sample of 10,642 respondents and the subsamples of 5,956 men and 4,686 women. Table 2 presents the weighted characteristics of the final analytical sample and the two gender subsamples.

Table 2. Weighted sample characteristics by gender (in percentages)

Variable	Category	Total (N = 10,642)	Men (N = 5,956)	Women (N = 4,686)	p-value
Age (in years)	Mean (SE)	42.53 (0.14)	42.39 (0.18)	42.70 (0.20)	.259
Partnership status					<.001***
	Unpartnered	22.53	24.92	19.39	
	Partnered	77.47	75.08	80.62	
Children under 16					.837
	No child under 16	40.01	39.89	40.17	
	Has child under 16	59.99	60.11	59.83	
Education					<.001***
	Primary or below	27.26	22.87	33.06	
	Secondary	47.91	53.07	41.13	
	Higher	24.82	24.07	25.82	

Table 2. Weighted sample characteristics by gender (in percentages)

Variable	Category	Total (N = 10,642)	Men (N = 5,956)	Women (N = 4,686)	p-value
Hukou status					.188
	Agricultural	68.74	67.89	69.86	
	Non-agricultural	17.84	18.75	16.65	
	Resident	13.42	13.37	13.49	
Work type					<.001***
	Non-agricultural work	61.87	64.66	58.20	
	Family agricultural work	22.38	18.18	27.90	
	Self-employed	12.55	13.89	10.78	
	Agricultural work for others	3.20	3.27	3.11	
Health Status					<.001***
	Excellent	15.92	17.74	13.52	
	Very good	16.26	16.76	15.61	
	Good	51.13	50.85	51.50	
	Fair	7.39	6.99	7.93	
	Poor	9.30	7.67	11.45	

*Significance tests refer to gender differences in the full categorical distribution. Significance notation: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.*

Turning first to the age profiles, the weighted mean age was 42.53 years overall, with 42.39 years for men and 42.70 years for women, and the two gender-specific means were numerically close. When it comes to partnership status, most respondents were married or cohabitating with a partner. More women than men were married or cohabiting, and the overall difference is statistically significant ($p < .001$). In terms of the presence of children under 16, about sixty per cent of respondents had at least one child under 16 years. The proportion of having children under 16 years old was nearly the same for men and women.

Table 2 also shows the education distribution. The difference between men and women in educational attainment was statistically significant ($p < .001$). Most respondents completed secondary or above education: 77.14% of men and 66.95% of women. In the subsamples, a larger share of women held primary education or below, whereas men were concentrated in secondary education. The proportions of women and men finishing higher education were relatively close.

Regarding household registration type, the overall distribution of hukou did not differ statistically significant between men and women ($p = .188$). At the same time, the occupation

distribution varied significantly between the two groups ($p < .001$). A larger share of women engaged in family agricultural work, whereas men had a larger percentage of non-agricultural employment and self-employment. The distribution of health status also differed significantly ($p < .001$). Men more often reported excellent and very good health, while women more often reported larger proportions in the fair and poor health categories.

5.1.2 Descriptive gender differences in time-use outcomes

Gender differences in work time and time poverty as preliminary empirical evidence were assessed next. Figure 1 displays the weighted weekly means by gender.

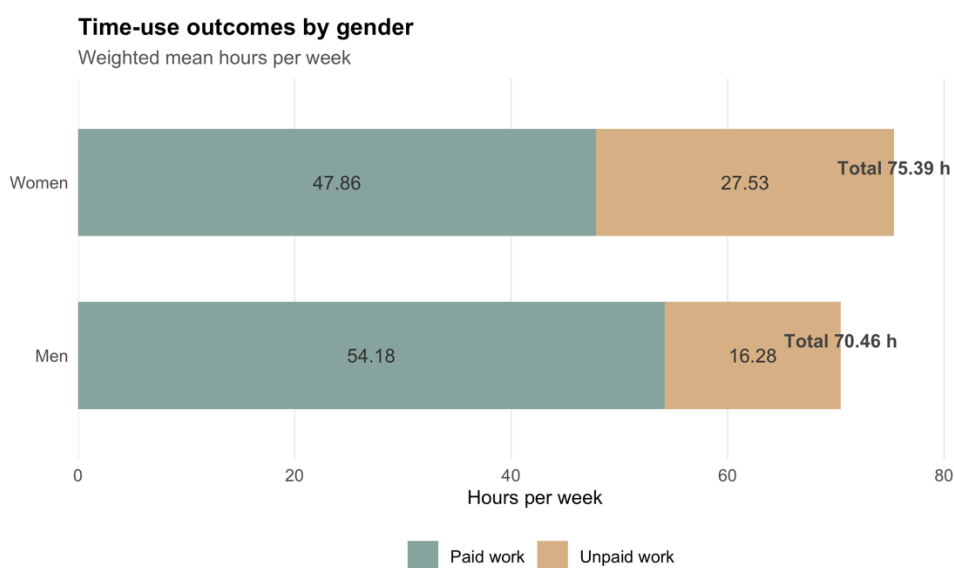


Figure 1. Weighted weekly average hours on time-use outcomes by gender

The differences did not follow the same pattern across paid and unpaid work. Men allocated an average of 54.18 hours per week to paid work, compared with 47.86 hours for women. The women-minus-men difference was -6.33 hours (95% CI $[-7.46, -5.20]$, $p < .001$), indicating that women devoted fewer hours to paid work and related commuting. In contrast, women averaged 27.53 hours of unpaid work per week, compared with 16.28 hours for men. The corresponding difference was 11.25 hours (95% CI $[10.05, 12.45]$, $p < .001$). The larger difference in unpaid work outweighed the opposite difference in paid work. As a result, women's total workload was 4.93 hours higher than men's (95% CI $[3.51, 6.34]$, $p < .001$).

5.1.3 Descriptive gender differences in the FGT indices of time poverty

Across the full analytical sample, the overall time-poverty prevalence was 52.89% under the 68.4-hour threshold and 24.90% under the weighted P75 threshold. The weighted P75 threshold

identified approximately the upper quarter of the total-workload distribution and averaged 85.53 hours across the five imputed datasets (range: 85.33–85.67 hours). The distributions of total workload and the positions of the two thresholds are shown in Appendix Figure B3.

Figure 2 presents weighted rates of time poverty (P_0) under two time-poverty lines by gender. Regardless of which of the two thresholds was adopted, women exhibited a higher prevalence of time poverty than men. Under the 68.4-hour threshold, 57.42% of women and 49.45% of men were classified as time poor. The unadjusted gender gap was 7.97 percentage points (pp) with a 95% CI [5.31, 10.62], $p < .001$. Under the weighted P75 threshold, the corresponding estimates were 29.09% for women and 21.73% for men. The gender gap was 7.36 pp (95% CI [4.96, 9.76], $p < .001$). Although overall prevalence fell substantially under the stricter threshold, the women–men difference remained similar.

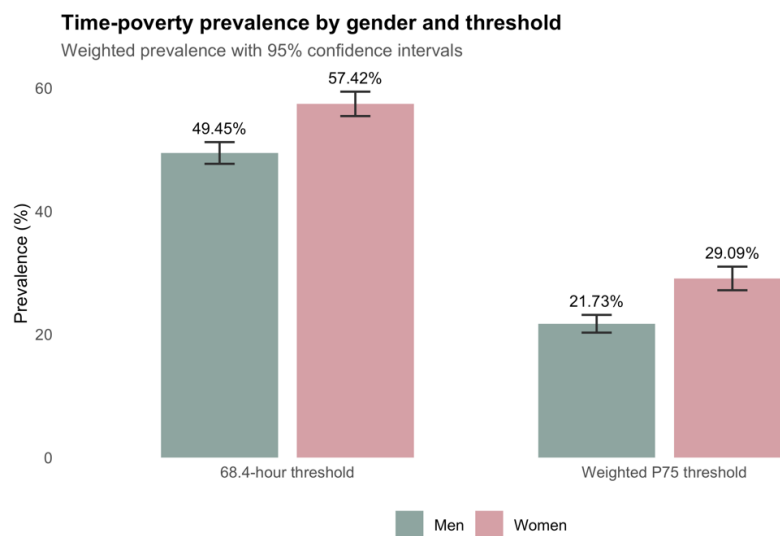


Figure 2. Weighted time-poverty prevalence by gender and threshold

The other two FGT indices showed the same direction of difference. Women had higher values for both the time poverty gap index (P_1) and time poverty severity index (P_2). Under the first threshold, the women-minus-men differences was .050 for P_1 , and .049 for P_2 , both statistically significant at $p < .001$. Under the second threshold, the corresponding differences were .024 and .019, respectively. Thus, the female disadvantage was observed not only in prevalence, but also in the depth and severity of time poverty under both thresholds. Table 3 below reports the full estimates.

Table 3. Time-poverty prevalence, gap, and severity by gender (in weighted estimates)

Measure	Total	Men	Women	Women - Men	95% CI
68.4-hour threshold					
P0: prevalence (%)	52.89	49.45	57.42	7.97***	[5.31, 10.62]
P1: normalized gap	.173	.151	.201	.050***	[.034, .066]
P2: severity	.115	.094	.143	.049***	[.024, .074]
Weighted P75 threshold					
P0: prevalence (%)	24.90	21.73	29.09	7.36***	[4.96, 9.76]
P1: normalized gap	.062	.052	.075	.024***	[.014, .033]
P2: severity	.036	.028	.046	.019**	[.006, .031]

P0 is reported in percentage points; P1 and P2 retain their original scales.

5.2 Multivariate analysis

The observed gender differences in time use and time poverty may be predicted by partnership status, presence of children under age 16, educational attainment, hukou type, work type, and health status. This section assessed whether these differences remained after the observed socio-demographic and employment characteristics were included in the weighted regression models. Model diagnostics showed no problematic multicollinearity (see Appendix Table A1). Adjusted GVIF values ranged from 1.016 to 1.393. Table 4 reports the core coefficients: Panel A reports weighted OLS differences in weekly hours, and Panel B reports average marginal effects (AMEs) and complementary odds ratios from the logistic models. The full OLS and logistic regression estimates are reported in Appendix Tables A2 and A3, respectively.

Table 4. Adjusted gender differences in work time and time poverty (reference: men)

Outcome / threshold	Estimate (SE)	95% CI	OR [95% CI]
Panel A: Time-use outcomes			
Paid work time	-4.65*** (0.55)	[-5.73, -3.57]	—
Unpaid work time	9.73*** (0.56)	[8.65, 10.82]	—
Total workload	5.08*** (0.71)	[3.70, 6.47]	—
Panel B: Time-poverty prevalence			
68.4-hour threshold	8.30*** (1.34)	[5.68, 10.92]	1.43*** [1.27, 1.60]
Weighted P75 threshold	7.16*** (1.20)	[4.80, 9.52]	1.49*** [1.31, 1.70]

5.2.1 Regression analysis of gender differences in time-use outcomes

All three adjusted differences reported in Table 4, Panel A were statistically significant ($p < .001$). Women's weekly paid work time was 4.65 hours lower than men's (95% CI [-5.73, -

3.57]), compared with an unadjusted difference of 6.33 hours. In contrast, women spent 9.73 more hours per week on unpaid work than men (95% CI [8.65, 10.82]), compared with an unadjusted difference of 11.25 hours.

Although both differences narrowed after adjustment, the unpaid-work difference remained substantially larger than the paid-work difference. Consequently, women's adjusted weekly total workload remained 5.08 hours higher than men's (95% CI [3.70, 6.47], $p < .001$), closely matching the unadjusted gap of 4.93 hours obtained from descriptive statistics. These findings supported H1a, H1b, H1c.

5.2.2 Regression analysis of gender differences in time-poverty prevalence

Table 4 Panel B reports the logistic regression results predicting probability of time poverty under the two thresholds. Under the 68.4-hour threshold, the women-minus-men AME was 8.30 pp (95% CI [5.68, 10.92], $p < .001$), with the corresponding odds ratio of 1.43 (95% CI [1.27, 1.60], $p < .001$). Results followed the same pattern under the weighted 75th-percentile threshold. The AME was 7.16 pp (95% CI [4.80, 9.52], $p < .001$), and the odds ratio was 1.49 (95% CI [1.31, 1.70], $p < .001$).

The adjusted differences were close to the unadjusted gaps of 7.97 pp and 7.36 pp. The result was therefore not a threshold-specific artefact: women remained more likely than men to be time poor after adjustment under both thresholds. H2 was supported, that is, women are more likely to experience time poverty.

5.3 Type-based exploratory analysis

For time-poor respondents, although they shared the same status of time poverty, they may experience the distinct variations in their workload. Having established that gender gaps existed, this section turns to a more critical question: how paid and unpaid work were composed among time-poor men and women? Two complementary views are used. The first compared the paid-unpaid composition of total workload, while the second classified time-poor respondents into five mutually exclusive categories.

5.3.1 Time-use composition of the time-poor

Figure 3 presents the shares of paid and unpaid work in total workload by gender among time-poor under both thresholds.

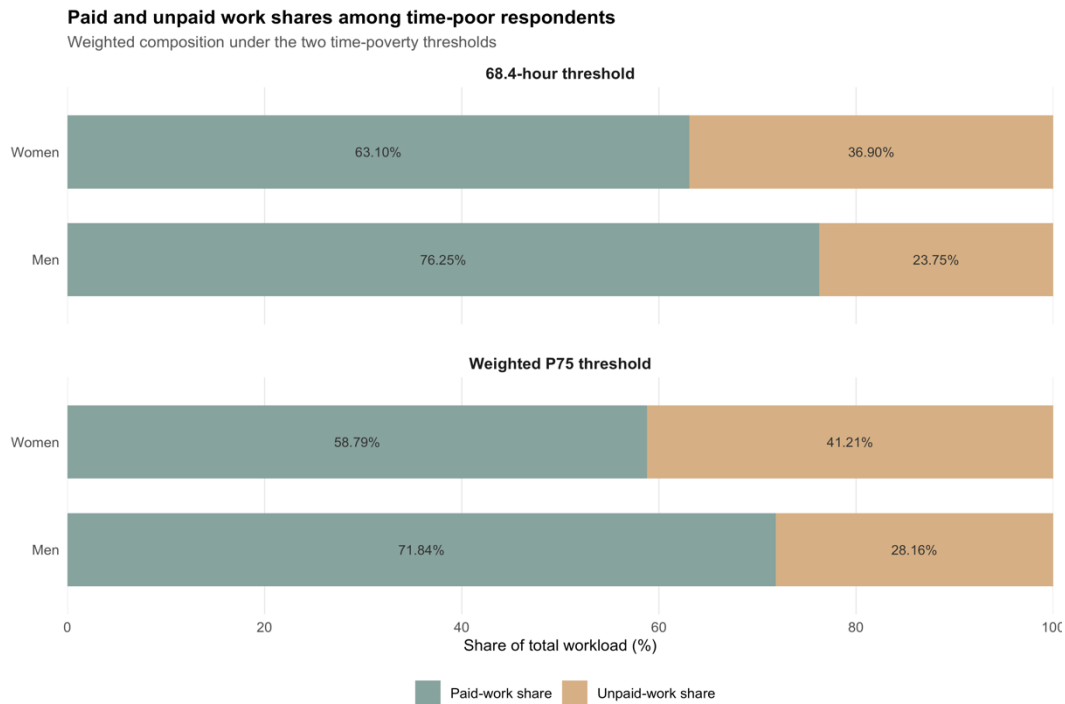


Figure 3. The shares of paid and unpaid work in total workload by gender and threshold

Under the 68.4-hour threshold, unpaid work accounted for 36.90% of the total workload among women and 23.75% among men. The women-minus-men difference in unpaid-work share was 13.15 pp (95% CI [11.60, 14.71], $p < .001$). Correspondingly, paid work paid-work shares showing the opposite pattern. A very similar difference was observed under the weighted P75 threshold: unpaid work represented 41.21% of women's total workload and 28.16% of men's, producing a difference of 13.05 pp (95% CI [10.57, 15.54], $p < .001$). The paid-unpaid composition of total workload therefore remained distinctly different between men and women across the two thresholds.

Table 5 reports the concrete hours of time-use outcomes among time-poor respondents. Under the 68.4-hour threshold, women had 9.83 fewer paid-work hours but 12.92 more unpaid-work hours than men. Because the unpaid-work difference was larger than the opposite paid-work difference, women's total workload remained 3.09 hours higher (95% CI [1.42, 4.76], $p < .001$). Under the weighted P75 threshold, the corresponding differences widened to – 12.36 hours and 14.17 hours. Despite these larger differences in the two components, the overall workload difference narrowed to 1.82 hours and was no longer statistically significant (95% CI [–0.78, 4.41], $p = .170$). Thus, among the time-poor, the difference between men and women was more consistently visible in the composition of paid and unpaid work than in total workload itself.

Table 5. Time-use outcomes among the time-poor (hours per week)

Measure	Men	Women	Women - Men	95% CI	p-value
68.4-hour threshold					
Paid work time	66.69	56.86	-9.83***	[-11.34, -8.32]	<.001***
Unpaid work time	22.54	35.46	12.92***	[11.04, 14.80]	<.001***
Total workload	89.23	92.32	3.09***	[1.42, 4.76]	<.001***
Weighted P75 threshold					
Paid work time	74.28	61.92	-12.36***	[-15.03, -9.68]	<.001***
Unpaid work time	31.53	45.70	14.17***	[10.91, 17.43]	<.001***
Total workload	105.81	107.62	1.82	[-0.78, 4.41]	.170

5.3.2 Five-category classification under the 68.4-hour threshold

Table 6 reports the distribution of five-category time-poverty types, while Figure 4 visualises the differences between men and women.

Table 6. Distribution of the five time-poverty categories by gender and threshold

Category	Men (%)	Women (%)	Women - Men (pp)	95% CI	p-value	Minimum cell n
68.4-hour threshold						
Paid-work excess	46.22	24.48	-21.74	[-25.09, -18.39]	< .001	693
Unpaid-work excess	3.15	9.20	6.05	[3.81, 8.30]	< .001	104
Dual excess	1.44	1.20	-0.24	[-1.08, 0.60]	.576	37
Cumulative: paid-dominant	43.21	51.47	8.26	[4.55, 11.97]	< .001	1,246
Cumulative: unpaid-dominant	5.98	13.65	7.67	[5.53, 9.80]	< .001	182
Weighted P75 threshold						
Paid-work excess	27.50	13.24	-14.27	[-18.63, -9.90]	< .001	178
Unpaid-work excess	3.16	7.80	4.64	[2.43, 6.85]	< .001	42
Dual excess	0.20	0.49	—	—	—	6
Cumulative: paid-dominant	56.84	54.26	-2.58	[-8.00, 2.84]	.351	782
Cumulative: unpaid-dominant	12.30	24.21	11.92	[7.43, 16.40]	< .001	193

Percentages are survey weighted. Minimum cell n is the minimum unweighted gender-specific cell size across the five imputed datasets.

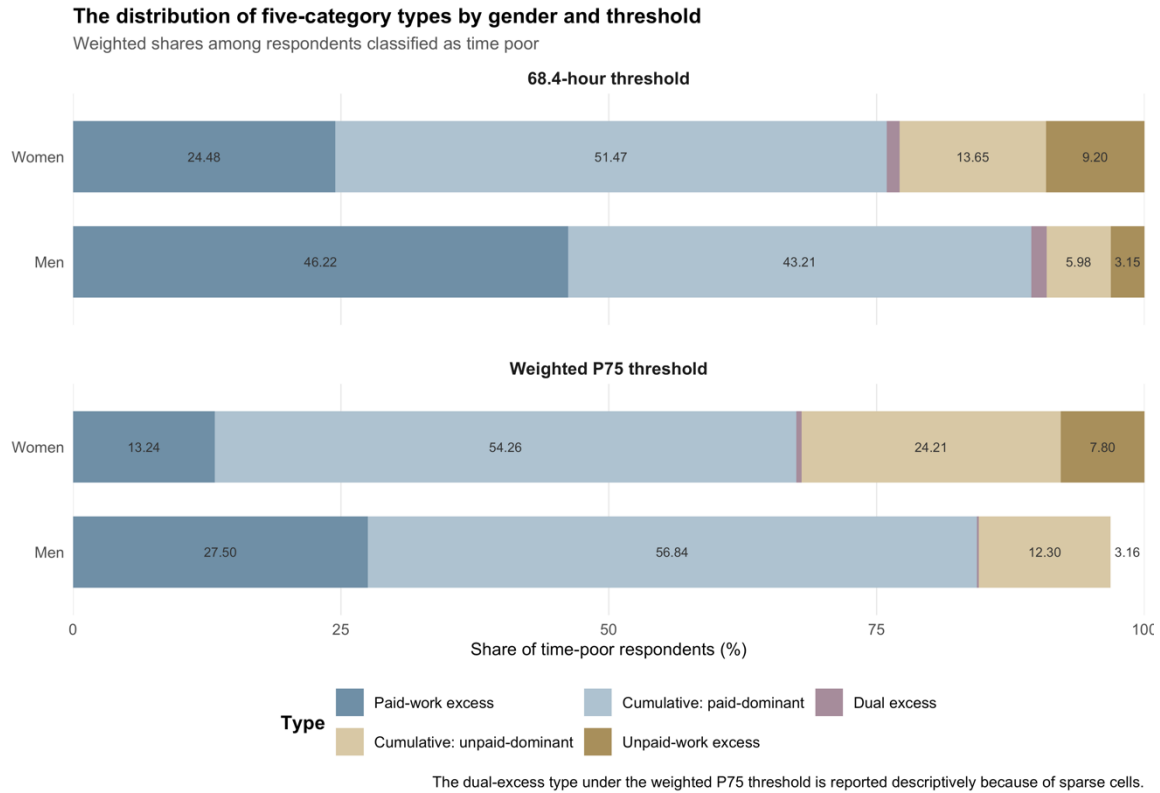


Figure 4. The distribution of five-category types by gender and threshold

Under the 68.4-hour threshold, the most common category differed between the two groups. Paid-work excess was the greatest category among time-poor men, accounting for 46.22%, whereas only 24.48% of time-poor women fell into this category. By contrast, cumulative excess with paid-work dominance was the largest category among women, accounting for 51.47%, compared with 43.21% among men. The corresponding women-minus-men difference were -21.74 pp and 8.26 pp, respectively, and both were statistically significant.

More broadly, the distribution of men was concentrated in two paid-centred forms of time poverty: paid-work excess and cumulative excess with paid-work dominance together represented 89.43% of time-poor men. Women, in contrast, were more concentrated in the cumulative categories, which together accounted for 65.12% of time-poor women, compared with 49.19% of men.

The remaining categories showed a similar directional pattern. Cumulative excess with unpaid-work dominance was 7.67 pp more common among women (95% CI [5.53, 9.80], $p < .001$), while unpaid-work excess type was likewise 6.05 pp more common (95% CI [3.81, 8.30], $p < .001$). The type of dual excess was rare among both groups and show no statistically significant difference ($p = .576$).

5.3.3 Five-category classification under the weighted P75 threshold

Under the weighted 75th-percentile threshold, the primary type of time poverty was the same both for men and women. Cumulative excess with paid work dominance accounted for 56.84% of time-poor men and 54.26% of time-poor women, making it the most common type in both groups. The difference was -2.58 pp (95% CI [-8.00, 2.84], $p = .351$) and no statistically significant difference was observed.

Despite this similarity in the dominant category, clear differences remained in several other types. Paid-work excess was more common among men, with a women-minus-men difference of -14.27 pp (95% CI [-18.63, -9.90], $p < .001$). By contrast, cumulative excess with unpaid-work dominance was 11.92 pp more common among women (95% CI [7.43, 16.40], $p < .001$), while unpaid-work excess was 4.64 pp more common (95% CI [2.43, 6.85], $p < .001$). The distribution, therefore, became more accordant between men and women in the largest category under the higher threshold, while differences in paid- and unpaid-work-oriented forms of time poverty remained evident.

Dual excess remained rare under this threshold, accounting for only 0.20% of time-poor men and 0.49% of time-poor women. Because the smallest cell contained only six observations, this category was reported descriptively, and no formal inference regarding the gender difference was made.

5.4 Heterogeneity analysis

This section moves to examine whether the women-minus-men gap varied across two family contexts: partnership status and the presence of children under 16. Table 7 fully reports the corresponding within-group AME gaps and the between-group differences in those gaps. Figure 5 displays the predicted probabilities for men and women.

Table 7. Family-context heterogeneity in the adjusted gender gap in time-poverty prevalence

Family-Context	68.4-h gender gap (pp)	95% CI	P-value	Weighted P75 gender gap (pp)	95% CI	P-value
Panel A: Partnership status						
Unpartnered	-5.22	[-10.72, 0.28]	.063	0.46	[-4.15, 5.06]	.846
Partnered	12.03	[9.03, 15.03]	<.001***	8.70	[5.96, 11.43]	<.001***
Between-group difference	17.25	[11.00, 23.50]	<.001***	8.24	[2.83, 13.65]	.003**

Table 7. Family-context heterogeneity in the adjusted gender gap in time-poverty prevalence

Family-Context	68.4-h gender gap (pp)	95% CI	P-value	Weighted P75 gender gap (pp)	95% CI	P-value
Panel B: Presence of children under 16						
No child under 16	5.13	[0.64, 9.62]	.025*	5.32	[1.34, 9.30]	.009**
Has child under 16	10.44	[7.26, 13.61]	<.001***	8.32	[5.36, 11.28]	<.001***
Between-group difference	5.31	[-0.16, 10.77]	.057	3.00	[-1.99, 7.98]	.238

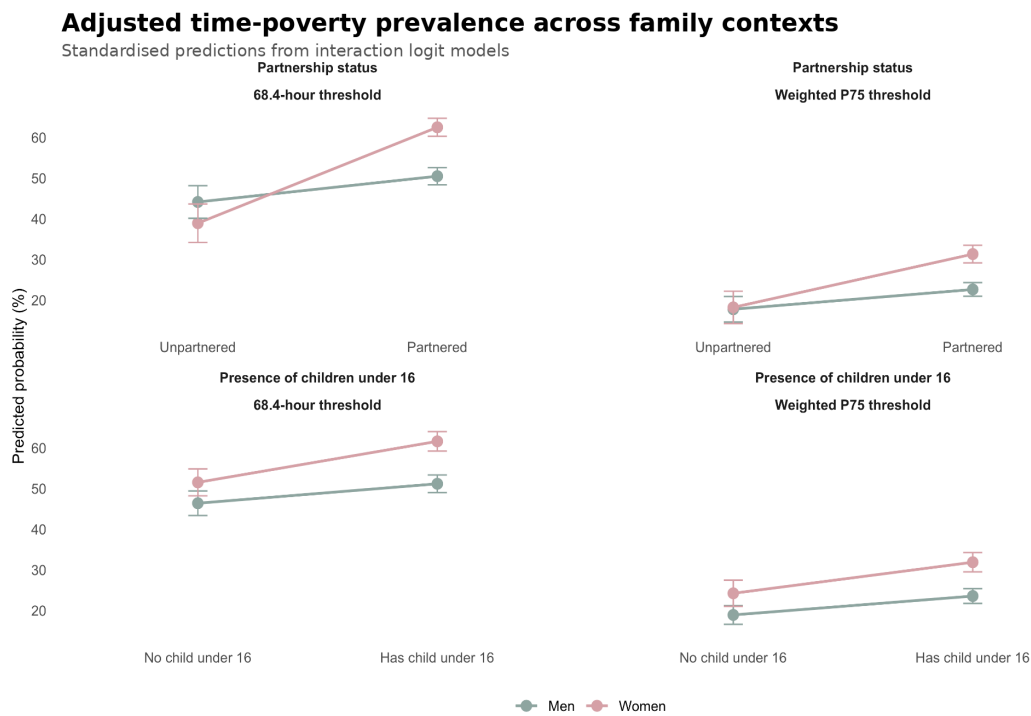


Figure 5. Adjusted time-poverty prevalence across two family contexts by gender

5.4.1 Gender differences in time-poverty prevalence by partnership status

Partnership status showed statistically significant between-group differences at both thresholds. Under the 68.4-hour threshold, among unpartnered respondents, the women-minus-men gap was -5.22 pp and was not statistically significant (95% CI [-10.72, 0.28], $p = .063$). Among partnered respondents, however, women's predicted probability of time poverty was 12.03 pp higher than men's (95% CI [9.03, 15.03], $p < .001$). The contrast between the two groups was substantial, with gaps of 17.25 pp (95% CI [11.00, 23.50], $p < .001$).

When the weighted 75th-percentile threshold was applied, the magnitude of the contrast narrowed but still statistically significant. Among the unpartnered subsample, women and men

had nearly the same predicted probabilities of time poverty, with gaps of 0.46 pp (95% CI [-4.15, 5.06], $p = .846$). In contrast, among partnered subsample, women's predicted probability of time poverty was 8.70 pp significantly higher than men's (95% CI [5.96, 11.43], $p < .001$). The between-group difference in gender gaps was 8.24 pp (95% CI [2.83, 13.65], $p = .003$). Thus, the difference between men and women was concentrated among partnered respondents under both thresholds, supporting H3a.

5.4.2 Gender differences in time-poverty prevalence by the presence of children under 16

The analysis then turns to the second family context. Under both thresholds, women had significantly higher predicted probabilities of time poverty than men, regardless of whether children were present. Under the 68.4-hour threshold, the women-minus-men gap was 5.13 pp among respondents without children under 16 and 10.44 pp among those with children. Under the weighted P75 threshold, the corresponding gaps were 5.32 pp and 8.32 pp.

Although the point estimates were larger among respondents with children, the between-group differences were not statistically significant under either threshold. Under the 68.4-hour threshold, the difference between the two gaps was 5.31 pp (95% CI [-0.16, 10.77], $p = .057$), while under the weighted P75 threshold it narrowed to 3.00 pp (95% CI [-1.99, 7.98], $p = .238$). Thus, H3b, which predicted that the presence of children would widen the women-minus-men gap, was not supported.

5.4.3 Gender differences in the FGT indices of time poverty across family contexts

A separate supplementary analysis examined unadjusted within-context differences between men and women in FGT indices (P_0, P_1, P_2) of time-poverty (see Figure 6 and Appendix Table A4).

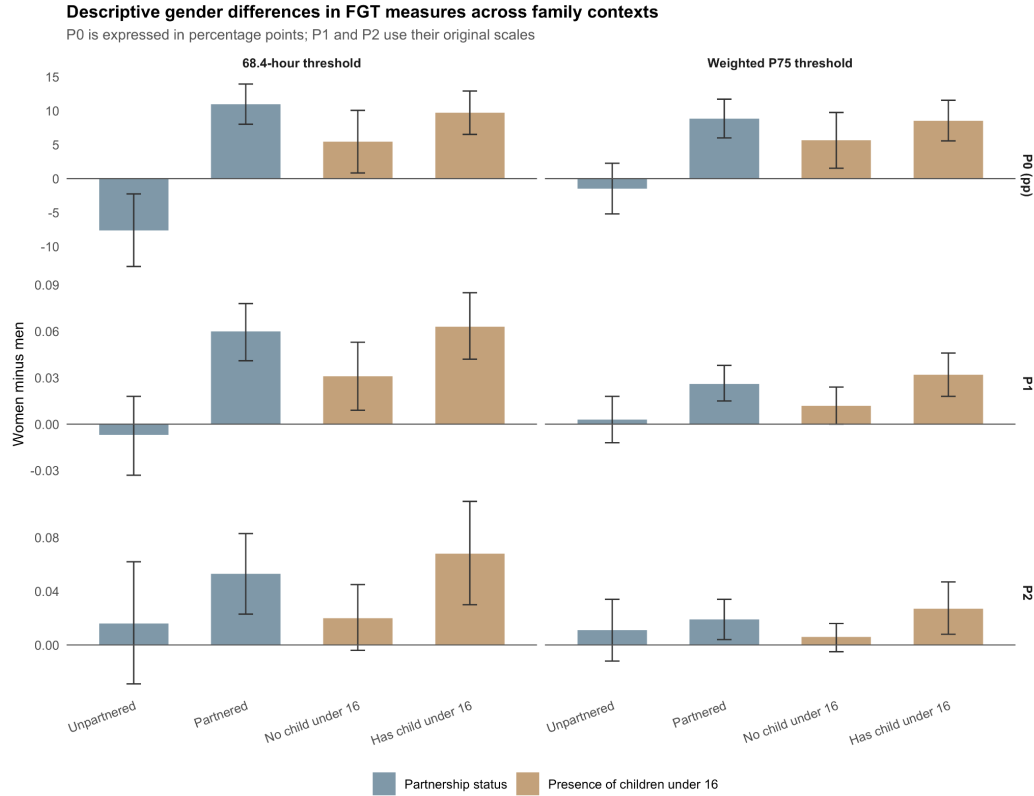


Figure 6. Descriptive gender differences in FGT indices of time poverty across family contexts

The subgroup results divided by partnership showed a clear contrast. Under the 68.4-hour threshold, among unpartnered respondents, women’s time-poverty prevalence (P_0) was 7.60 pp lower than men’s (95% CI $[-12.94, -2.25]$, $p = .005$). The gender differences in depth ($P_1 = -.007$, $p = .566$) and severity ($P_2 = .016$, $p = .475$) were not statistically significant. Under the weighted P75 threshold, none of the three FGT indices differed significantly by gender among unpartnered respondents. Among partnered respondents, by contrast, women had significantly higher prevalence, depth, and severity under both thresholds.

When the sample was divided by the presence of children, women without children under 16 had significantly higher time-poverty prevalence under both thresholds (5.45 pp and 5.63 pp, respectively). Differences in depth and severity were less consistent in this group. Among respondents with children under 16, however, women had significantly higher values for all three FGT indices under both thresholds. Overall, in terms of the prevalence, depth and severity of time poverty, women with partners and women with children under the age of 16 exhibit the most consistent gender disadvantage.

5.5 Sensitivity analysis

A set of sensitivity analyses examined whether the main results depended on the treatment of commuting time, missing data, outliers in reported time, or the restriction to wage employees with log wage income included as an additional covariate. The stability of the adjusted gender differences in time-use outcomes and time-poverty prevalence across the alternative specifications is visualised in Appendix Figures B4 and B5, with the corresponding estimates reported in Appendix Tables A5 and A6. The FGT indices are reported in Appendix Tables A7.

After excluding respondents without a fixed workplace, restricting the analysis to the complete-case sample, and removing observations with a total weekly workload more than 168 hours, the adjusted estimates for all three time-use outcome variables remained close to the main models. Across these three checks, the gender difference ranged from -4.89 to -4.70 hours for paid work, from 9.35 to 9.65 hours for unpaid work, and from 4.59 to 4.95 hours for total workload. All estimates were statistically significant ($p < .001$). The gender gaps were comparatively smaller in the wage employee subsample. Specifically, women spent 3.45 fewer hours in paid work than men, but 7.84 more hours in unpaid work and 4.39 more hours in total workload, with all three estimates were statistically significant ($p < .001$).

The descriptive FGT indices contrasts remained robust. The gender differences in P_0 and P_1 were positive and statistically significant in every sensitivity check. P_2 also remained significant in all but one case: in the wage-employee sample under the weighted P75 threshold, the P_2 difference was .015 (95% CI [-.002, .033], $p = .091$).

Additionally, the adjusted estimates of time-poverty prevalence were likewise not sensitive to these analytical choices. Under the 68.4-hour threshold, the AMEs ranged from 7.70 pp to 8.23 pp. Under the weighted 75th-percentile threshold, it correspondingly ranged from 6.41 pp to 7.21 pp. Statistical significance is observed for all estimated coefficients. Thus, each sensitivity analysis identified a higher probability of time poverty among women, while the estimated magnitude of the gap varied only within a relatively narrow range.

In sum, the sensitivity analyses therefore remained consistent with the dual-gender pattern observed in the main analysis, that is, time poverty was prevalent among both women and men, but the primary sources of their burdens differed. Men consistently spent more time in paid work, whereas women consistently bore more unpaid work and a greater total workload.

6. Discussion

The main purpose of this study is to examine whether time poverty among employed working-age adults in China exhibits gendered structures, and to precisely illustrate how these differences are constituted through different combinations of time allocation between paid and unpaid work. The discussion focuses on three aspects of the findings: the gendered composition of time poverty, its depth and severity, and variation across family contexts.

6.1 Gendered division of time poverty: paid and unpaid work

The first finding of this study is that the sources of time pressure exhibit a clear gender division between men and women. Men spent more hours on paid work whereas women spent relatively fewer hours on paid work yet devoted remarkably more time to housework and family care, together showing two sides of the gendered labour pattern. Although the paid- and unpaid-work gaps ran in opposite directions, the larger unpaid-work gap more than offset women's lower paid-work time. Our findings echo the division of labour patterns identified by the previous Chinese time-use studies and wider cross-national comparisons, that is, men's labour time is concentrated in market work, whereas women shoulder the bulk of labour within the family (Dong and An, 2015; Rubiano-Matulevich and Viollaz, 2019; Giménez and Molina Chueca, 2020).

A more remarkable finding is the daily burden brought to working women as a result of the combined demands of paid employment and unpaid work. For employed women, relatively lower involvement in the market sphere fails to translate into more available time. Instead, paid employment and domestic responsibilities together extended women's total work time, and this dynamic pattern is consistent with the continuous presence of "the second shift" described by Hochschild and Machung (2012). Crucially, it highlights how social reproduction responsibilities continuously shape the daily lives of working women (Fraser, 2016). In this sense, the longer total working hours of women are not merely the result of personal time allocation, but also reflect the uneven distribution of paid labour and family reproduction responsibilities between gender. As Rao et al.,(2024) similarly argue, combining time investment with the different categories of labour provides an important perspective for recognising the contribution of social reproduction.

The analysis of the five-category classification among the time-poor reveals differences in the social sources of time pressure that would remain hidden if time-poor respondents were treated as a homogeneous group. Under the literature-based threshold of 68.4 hours, men tend to fall into time-poor status driven solely by very long paid-work hours. At the same time, women were more likely to be classified as time poor through the accumulation of paid and unpaid work. When the sample-relative threshold was adopted, and the analysis shifted to respondents with heavier workloads, cumulative paid-work-dominant time poverty became the most common category for both men and women. As proposed by Williams, Masuda and Tallis (2016), threshold setting will change the scope of the time-poor population and its internal characteristics. The pattern implies that extreme time pressure is typically formed in the simultaneous expansion of market work and family labour. The near-identical compositional gaps across thresholds indicate that the relative allocation of paid and unpaid work by gender changed little as the threshold became stricter. Women, nevertheless, remained more concentrated in categories in which unpaid work accounted for a larger share. The importance of unpaid work in women's time poverty was therefore manifested primarily through its accumulation with paid work. It suggests that the gendered division of labour persisted even among those experiencing the most serious time poverty. This finding is in a line with research showing that women's increased participation in paid work has not been matched by an equal redistribution of unpaid work (Sayer, 2005; Piasna and Drahokoupil, 2017).

6.2 Beyond prevalence: depth and severity of time poverty

A narrow definition of work will sever the connection between market labour and social reproductive work, and it will also underestimate the actual length of women's workday (Folbre, 2006; Sayer, 2005). By integrating both categories of labour, the three FGT indices show the gendered structure of time poverty with women's higher risk of being time-poor. Gender disparities likewise extend to the depth and severity of time poverty. That means that time constraints are more concentrated and stronger among women who have fallen into time poverty. This pattern has not changed substantially after controlling for the sociodemographic and employment characteristics, remaining consistent under both time poverty thresholds. This suggests that gender differences should not only be understood as the difference in prevalence under a certain threshold selection.

Women's deeper and more severe time poverty may be related to the nature of unpaid labour itself. Housework and family care do not simply represent additional hours in the working day. Many of these tasks are repetitive, time-specific, and difficult to transfer freely to others or postpone for a long time (Bhattacharya, 2017; Ferguson, 2019). Even if women reduce their time input to paid work, they may not be able to lighten these family responsibilities to the same extent. Accordingly, once the total workload exceeds the time-poverty threshold, it may be more difficult for some groups, especially for women burdened with heavier unpaid reproductive labour, to bring their total workload back below the threshold by reallocating their daily activities.

Qi and Dong (2018) found that female workers in urban China were more likely to experience time poverty and linked this to the dual pressures of paid labour and family responsibilities. The results of this study align with the previous findings and extend them to a national sample of employed adults aged 18–59 using a more recent survey dataset. A similar structure has also been observed in other social settings. Arora (2015) noted that even when men and women both devoted similar amounts of time to economic activities, and housework and care work still significantly increased the overall workload of women. This study observes the same accumulation process, and further highlights women's vulnerability throughout the prevalence, depth and severity of time poverty.

6.3 Family contexts of gendered time poverty: partnership and children

Marriage or partnership is usually accompanied by an increase in men's market employment and women's household labour, this specialisation pattern is common in China and other countries (Dong and An, 2015; Rubiano-Matulevich and Viollaz, 2019). Our study shows that this division of labour is further reflected in time poverty. The between-group contrasts showed clear heterogeneity by partnership status, with women's disadvantage concentrated among partnered respondents. Specifically, women who were married or cohabiting continued to show a higher probability of experiencing time poverty, whereas the gender difference among unpartnered respondents was weak and statistically non-significant. Marriage combines employment, daily family arrangement and care responsibilities more closely, and women's paid labour and family labour thereby are more likely to accumulate in this relationship (Dong and An, 2015; Luo and Chui, 2018).

In contrast, although the estimated gender gaps were larger among respondents with children under 16, the between-group differences were not statistically significant under either threshold. The age of children and the stage of parenting change the care time required by the family, and grandparental support, childcare arrangements and gender norms within the family also redistribute these responsibilities (Chen, 2024; Zhang, Wang and Hou, 2024). From this insight, the way to treat all families with minor children as the same category tends to bring together different stages of the family life-course, and the resulting average may obscure time pressure concentrated in certain family contexts.

6.4 Implications

From an empirical perspective, similar to our analysis, by comparing time allocation in paid work, housework and care, the previous studies have examined gender differences in division of labour and their implications for time poverty in China (Dong and An, 2015; Qi and Dong, 2018). These studies provide important evidence that women's disproportionate responsibility for household labour translates into disadvantages in time resources. Based on the solid foundation of these works, our research, using the newer national personal dataset, extends empirical evidence on gendered distribution in time poverty and examines its prevalence, depth, severity using the FGT indices. In particular, we focus on five mutually exclusive types according to time allocation of paid and unpaid work. These innovations enable us to distinguish between time poverty arising solely from excessive paid or unpaid work and that jointly formed by the accumulation of both forms. Furthermore, by evaluating these types under the absolute and relative thresholds respectively, our study offers an interesting portrait of how time poverty dynamically shifts across thresholds.

Theoretically, this study provides more empirical evidence on how gendered time-use distribution translates into gendered inequalities in time poverty by connecting the theory of time allocation and social reproduction theory. On the one hand, our findings follow Becker's (1965) fundamental premise that individual time budgets are strictly finite. Paid work, housework and other activities draw on the same finite time budget and therefore compete for time. We argue that paid and unpaid work jointly consume the time available to employed adults and their combined burden is reflected in the prevalence, depth, and severity of time poverty. Becker's (1965) framework takes the family as a unified decision-making unit. Guided by social

reproduction theory, our study therefore adds a gender perspective to the allocation-of time framework (Fraser, 2016; Bhattacharya, 2017). The operation of capitalist society relies on various routines and activities within a household, yet social reproduction that ought to be collectively shouldered by society has been almost privatized to individual households and disproportionately borne by women. Our findings align with the argument of this theory, for working women, the overlap between paid and unpaid work worsens their problems of time poverty.

On the other hand, men's time poverty may nevertheless receive insufficient attention. The discussion of existing time-use studies has focused more on how women unequally assume family responsibilities or experience a dual burden (Sayer, 2005; Hochschild and Machung, 2012). We highlight that our findings were indeed consistent with it. Noteworthy, it can be seen from our results that men also faced the issue of time poverty associated with their excessive time devotion to paid work. From this stance, the time dilemmas faced by men and women originally from the same gendered labour arrangement, but the form is different.

Our findings also offer several policy insights. Firstly, to address time poverty, it is essential to reduce burdens both in the labour market and within the household. Labour regulation should limit excessive working arrangements and toxic overtime to ensure employees' adequate rest time and actual control over their working hours. At the same time, social policies should shift the time costs of social reproduction away from individual households, especially from women, and socialise these burdens through the broader public. For instance, governments and public institutions should provide affordable and accessible childcare, eldercare, and other potential family-support services.

In addition, the significant gender gaps in the partnership context also suggest that public support services need to be coordinated with more male involvement. Although public services can reduce, to some degree, the overall amount of care workload within a family, it does not automatically redistribute the gendered pattern of the remaining household tasks (Jessen *et al.*, 2022). In this respect, the policymakers and relevant organisations should set as a core goal to promote the gender redistribution of domestic responsibilities within the family. More precisely, the design of policy should improve the practical feasibility at the institutional level for men to undertake housework and care responsibilities. For example, providing a realistic childcare

leave for fathers with strong guarantees and reducing the career penalty when men adopt family-friendly schedules.

6.5 Limitations and future research

There are some limitations in this thesis, which point to directions for future research. First of all, the recognition of time poverty in our analysis relies on retrospectively reported activity durations by the respondents in the CFPS. The reason is that the CFPS is not designed as a time diary survey, it cannot directly and fully record the most accurate time of all activities in a day. Therefore, paid and unpaid activities may overlap or be performed simultaneously, with the total workload may therefore double-count clock time. Future research can compare surveys using recall-based time records with time-diary survey. This would help test whether the two approaches have consistent findings on time poverty in terms of gender differences. By doing so, it also helps further verify whether simplified recall questions can be a feasible way to identify time poverty in large-scale social surveys. Such a survey could retain the advantages of the comprehensive survey involving a variety of socio-economic variables, while capturing the situation of time use in respondents' daily life.

Secondly, this thesis measures time poverty purely by objective dimension to calculate how long respondents spend on various daily activities. This approach allows us to make direct, standard comparisons of time allocation across different individuals, yet it misses how people subjectively experience time pressure. People carrying nearly identical total workloads can still feel vastly different levels of rushing, sense of command over their own schedule, or disruption to daily routines brought by tight time limits (Mattingly and Sayer, 2006; Szollos, 2009; Giurge, Whillans and West, 2020). Because of this limitation, later studies could do well to combine objective time-use measures with subjective time-pressure indicators, to evaluate if those gender gaps we observe also show up in people's firsthand feelings of being short on time.

Third, a deductive classification of time-poor people according to time allocation in paid-unpaid work was conducted in our analysis. It serves as a method to directly respond to research questions of this thesis. However, it limits the classification to available data in the CFPS and to categories defined in advance. Time poverty for some individuals may also arise from the accumulation of studying, health care, fragmented tasks or multiple tasks. Future research could compare this deductive classification with a data-driven approach, such as latent profile analysis

(LPA) by using comprehensive activity data, so as to explore the diversity within the time-poor people in detail.

Moreover, the discussion of family contexts only involved partnership status and the presence of children under 16. The broad child-presence measure combines families at different stages of the life course and may therefore obscure variation by children's age and care needs. Previous research suggests that children's age and gender norms shape the distribution of parental work and care time (Chen, 2024). Future studies could distinguish between children's age groups and incorporate intergenerational co-residence and grandparental care support. These perspectives help provide a clear understanding of time-poverty differences across diverse household situations in China.

7. Conclusion

This study set out to examine how the gendered allocation of paid and unpaid work is reflected in time poverty among employed adults in China. To pursue this question, the study investigated paid work, unpaid work and total workload, with particular attention to the five-category classification of time-poor respondents and differences across family contexts.

The main finding is that gender inequality in time is not only reflected in the length of working hours of men and women, but also in the different forms of labour that produce their total workload. Women's heavier unpaid responsibilities more than offset their shorter paid working hours, making their total workload greater, and their disadvantages extend from the prevalence of time poverty to its depth and severity. Meanwhile, the classification of time poverty shows that crossing the same threshold arises from different circumstances for men and women. Men's time poverty mostly links to excessive paid work, while women's time poverty is more related to the accumulation of paid and unpaid work demands. The gender gap was also concentrated among partnered adults, whereas the presence of children under 16 did not significantly widen this gap. By distinguishing prevalence from depth and severity, and by examining the paid–unpaid configurations within the time-poor population, this study shows that the same time-poverty status can vary in both intensity and labour composition.

Time poverty, therefore, cannot be reduced to a mere shortage of available time at the individual level. Time itself is formally equal in quantity, but the demands placed on it are not socially distributed equally. Gendered patterns of time poverty uncover a broader structural organisation where certain groups repeatedly absorb competing demands from formal employment, care work and routine domestic life.

This research is limited to objective measures of time poverty and relies on cross-sectional, retrospectively reported time-use data. In the future, it can be further expanded and analysed in combination with subjective scales and detailed time-diary and longitudinal panel data. From a policy perspective, the findings point to the need to improve public care services, regulate excessive working hours and promote a more equal sharing of family responsibilities.

References

- Agarwal, B. (1997) “‘bargaining’” and gender relations: Within and beyond the household’, *Feminist Economics*, 3(1), pp. 1–51. Available at: <https://doi.org/10.1080/135457097338799>.
- Aguiar, M. and Hurst, E. (2007) ‘Measuring trends in leisure: The allocation of time over five decades’, *The Quarterly Journal of Economics*, 122(3), pp. 969–1006. Available at: <https://doi.org/10.1162/qjec.122.3.969>.
- Ai, C. and Norton, E.C. (2003) ‘Interaction terms in logit and probit models’, *Economics letters*, 80(1), pp. 123–129.
- Alderman, H. *et al.* (1995) ‘Unitary versus collective models of the household: Is it time to shift the burden of proof?’, *The World Bank Research Observer*, 10(1), pp. 1–19. Available at: <https://doi.org/10.1093/wbro/10.1.1>.
- Alkire, S. and Foster, J. (2011) ‘Counting and multidimensional poverty measurement’, *Journal of Public Economics*, 95(7–8), pp. 476–487. Available at: <https://doi.org/10.1016/j.jpubeco.2010.11.006>.
- Anxo, D. *et al.* (2011) ‘Gender differences in time use over the life course in france, italy, sweden, and the US’, *Feminist Economics*, 17(3), pp. 159–195. Available at: <https://doi.org/10.1080/13545701.2011.582822>.
- Apps, P. (2005) ‘Gender, time use, and public policy over the life cycle’, *Oxford Review of Economic Policy*, 21(3), pp. 439–461. Available at: <https://doi.org/10.1093/oxrep/gri025>.
- Arora, D. (2015) ‘Gender differences in time-poverty in rural mozambique’, *Review of Social Economy*, 73(2), pp. 196–221. Available at: <https://doi.org/10.1080/00346764.2015.1035909>.
- As, D. (1978) ‘Studies of time-use: Problems and prospects’, *Acta Sociologica*, 21(2), pp. 125–141. Available at: <https://doi.org/10.1177/000169937802100203>.
- Bardasi, E. and Wodon, Q. (2006) ‘Measuring time poverty and analyzing its determinants: Concepts and application to guinea’, *Gender, time use, and poverty in Sub-Saharan Africa*, 73, pp. 75–95.
- Bardasi, E. and Wodon, Q. (2010) ‘Working long hours and having no choice: Time poverty in guinea’, *Feminist Economics*, 16(3), pp. 45–78. Available at: <https://doi.org/10.1080/13545701.2010.508574>.
- Becker, G.S. (1965) ‘A theory of the allocation of time’, *The Economic Journal*, 75(299), p. 493. Available at: <https://doi.org/10.2307/2228949>.
- Benston, M. (1969) ‘The political economy of women’s liberation’, *Monthly Review*, 21(4), p. 13. Available at: https://doi.org/10.14452/MR-021-04-1969-08_2.
- Bhattacharya, T. (ed.) (2017) *Social reproduction theory: Remapping class, recentring oppression*. 1st edn. Pluto Press. Available at: <https://doi.org/10.2307/j.ctt1vz494j>.
- Bianchi, S.M. *et al.* (2000) ‘Is anyone doing the housework? Trends in the gender division of household labor’, *Social Forces*, 79(1), p. 191. Available at: <https://doi.org/10.2307/2675569>.
- Bianchi, S.M. *et al.* (2012) ‘Housework: Who did, does or will do it, and how much does it matter?’, *Social Forces*, 91(1), pp. 55–63. Available at: <https://doi.org/10.1093/sf/sos120>.
- Bittman, M. (2002) ‘Social participation and family welfare: The money and time costs of leisure in australia’, *Social Policy & Administration*, 36(4), pp. 408–425. Available at: <https://doi.org/10.1111/1467-9515.t01-1-00262>.

- Bittman, M. *et al.* (2003) 'When does gender trump money? Bargaining and time in household work', *American Journal of Sociology*, 109(1), pp. 186–214. Available at: <https://doi.org/10.1086/378341>.
- Borra, C., Browning, M. and Sevilla, A. (2021) 'Marriage and housework', *Oxford Economic Papers*, 73(2), pp. 479–508. Available at: <https://doi.org/10.1093/oep/gpaa026>.
- Burda, M., Hamermesh, D.S. and Weil, P. (2013) 'Total work and gender: Facts and possible explanations', *Journal of Population Economics*, 26(1), pp. 239–261. Available at: <https://doi.org/10.1007/s00148-012-0408-x>.
- Cao, Y. and Rubin, B.A. (2014) 'Market transition and the deinstitutionalization of standard work hours in post-socialist China', *ILR Review*, 67(3), pp. 864–890. Available at: <https://doi.org/10.1177/0019793914537454>.
- Chan, K.W. and Buckingham, W. (2008) 'Is China abolishing the hukou system?', *The China Quarterly*, 195, pp. 582–606.
- Chatzitheochari, S. and Arber, S. (2012) 'Class, gender and time poverty: A time-use analysis of british workers' free time resources', *The British Journal of Sociology*, 63(3), pp. 451–471. Available at: <https://doi.org/10.1111/j.1468-4446.2012.01419.x>.
- Chen, X. (2024) 'The gendered division of housework in China: Parenthood effects and heterogeneity across parenthood stages', *Population Research and Policy Review*, 43(2), p. 30. Available at: <https://doi.org/10.1007/s11113-024-09872-9>.
- Chiappori, P. and Lewbel, A. (2015) 'Gary becker's a theory of the allocation of time', *The Economic Journal*, 125(583), pp. 410–442. Available at: <https://doi.org/10.1111/econj.12157>.
- China Academy of Urban Planning and Design and Baidu Maps (2024) [2024 Commuting Monitoring Report of Major Cities in China]. https://english.www.gov.cn/archive/statistics/202410/18/content_WS6711b75fc6d0868f4e8ec023.html
- Craig, L. and Mullan, K. (2010) 'Parenthood, gender and work-family time in the united states, australia, italy, france, and denmark', *Journal of Marriage and Family*, 72(5), pp. 1344–1361. Available at: <https://doi.org/10.1111/j.1741-3737.2010.00769.x>.
- Dong, X. and An, X. (2015) 'Gender patterns and value of unpaid care work: Findings from C hina's first large-scale time use survey', *Review of Income and Wealth*, 61(3), pp. 540–560. Available at: <https://doi.org/10.1111/roiw.12119>.
- Dong, X.-Y., Joffre, V.M. and Song, Y. (2022) 'Labor market conditions for health and elderly care workers in the people's republic of China', *Asian Development Bank* [Preprint]. Available at: <https://www.aeaweb.org/conference/2023/program/powerpoint/TE9Z2Gyh> (Accessed: 7 August 2026).
- Douthitt, R.A. (2000) "'time to do the chores?'" factoring home-production needs into measures of poverty', *Journal of Family and Economic Issues*, 21(1), pp. 7–22. Available at: <https://doi.org/10.1023/A:1009423329532>.
- Du, F., Dong, X. and Zhang, Y. (2023) 'Educational differences in parental time devoted to childcare in China', *China Economic Review*, 80, p. 102001.
- Du, F. and Zhao, Y. (2025) 'Time use among urban women in China at different income levels', *Journal of Asian Economics*, 96, p. 101866. Available at: <https://doi.org/10.1016/j.asieco.2024.101866>.
- Ferguson, S. (2019) *Women and work: Feminism, labour, and social reproduction*. 1st edn. Pluto Press. Available at: <https://doi.org/10.2307/j.ctvs09qm0>.
- Floro, M.S. (1995) 'Economic restructuring, gender and the allocation of time', *World Development*,

23(11), pp. 1913–1929. Available at: [https://doi.org/10.1016/0305-750X\(95\)00092-Q](https://doi.org/10.1016/0305-750X(95)00092-Q).

Floro, M.S. and Miles, M. (2003) ‘Time use, work and overlapping activities: Evidence from australia’, *Cambridge Journal of Economics*, 27(6), pp. 881–904.

Folbre, N. (1995) “‘holding hands at midnight’: The paradox of caring labor’, *Feminist Economics*, 1(1), pp. 73–92. Available at: <https://doi.org/10.1080/714042215>.

Folbre, N. (2006) ‘Measuring care: Gender, empowerment, and the care economy’, *Journal of Human Development*, 7(2), pp. 183–199. Available at: <https://doi.org/10.1080/14649880600768512>.

Folbre, N. and Nelson, J.A. (2000) ‘For love or money—or both?’, *Journal of Economic Perspectives*, 14(4), pp. 123–140. Available at: <https://doi.org/10.1257/jep.14.4.123>.

Foster, J., Greer, J. and Thorbecke, E. (1984) ‘A class of decomposable poverty measures’, *Econometrica*, 52(3), p. 761. Available at: <https://doi.org/10.2307/1913475>.

Fraser, N. (2016) ‘Contradictions of capital and care’, *New Left Review*, 2(100), pp. 99–117. Available at: <https://doi.org/10.64590/nt2>.

Fuwa, M. (2004) ‘Macro-level gender inequality and the division of household labor in 22 countries’, *American Sociological Review*, 69(6), pp. 751–767. Available at: <https://doi.org/10.1177/000312240406900601>.

Gammage, S. (2010) ‘Time pressed and time poor: Unpaid household work in guatemala’, *Feminist Economics*, 16(3), pp. 79–112. Available at: <https://doi.org/10.1080/13545701.2010.498571>.

Geist, C. (2005) ‘The welfare state and the home: Regime differences in the domestic division of labour’, *European Sociological Review*, 21(1), pp. 23–41. Available at: <https://doi.org/10.1093/esr/jci002>.

Giménez, J.I. and Molina Chueca, J.A. (2020) ‘The gender gap in time allocation in europe’, *SSRN Electronic Journal* [Preprint]. Available at: <https://doi.org/10.2139/ssrn.3648801>.

Giurge, L.M., Whillans, A.V. and West, C. (2020) ‘Why time poverty matters for individuals, organisations and nations’, *Nature Human Behaviour*, 4(10), pp. 993–1003. Available at: <https://doi.org/10.1038/s41562-020-0920-z>.

Glinskaya, E. and Feng, Z. (2018) *Options for aged care in China: Building an efficient and sustainable aged care system*. World Bank Publications.

Goodin, R.E. et al. (2005) ‘The time-pressure illusion: Discretionary time vs. Free time’, *Social Indicators Research*, 73(1), pp. 43–70. Available at: <https://doi.org/10.1007/s11205-004-4642-9>.

Gronau, R. (1977) ‘Leisure, home production, and work--the theory of the allocation of time revisited’, *Journal of Political Economy*, 85(6), pp. 1099–1123. Available at: <https://doi.org/10.1086/260629>.

Gupta, S. (2007) ‘Autonomy, dependence, or display? The relationship between married women’s earnings and housework’, *Journal of Marriage and Family*, 69(2), pp. 399–417. Available at: <https://doi.org/10.1111/j.1741-3737.2007.00373.x>.

Guryan, J., Hurst, E. and Kearney, M. (2008) ‘Parental education and parental time with children’, *Journal of Economic Perspectives*, 22(3), pp. 23–46. Available at: <https://doi.org/10.1257/jep.22.3.23>.

Harvey, A.S. and Mukhopadhyay, A.K. (2007) ‘When twenty-four hours is not enough: Time poverty of working parents’, *Social Indicators Research*, 82(1), pp. 57–77. Available at: <https://doi.org/10.1007/s11205-006-9002-5>.

Hochschild, A. and Machung, A. (2012) *The second shift: Working families and the revolution at home*.

Penguin..

Hook, J.L. (2006) 'Care in context: Men's unpaid work in 20 countries, 1965–2003', *American Sociological Review*, 71(4), pp. 639–660. Available at: <https://doi.org/10.1177/000312240607100406>.

Idler, E.L. and Benyamini, Y. (1997) 'Self-rated health and mortality: A review of twenty-seven community studies', *Journal of health and social behavior*, pp. 21–37.

Jessen, J. *et al.* (2022) 'The gender division of unpaid care work throughout the COVID-19 pandemic in germany', *German Economic Review*, 23(4), pp. 641–667. Available at: <https://doi.org/10.1515/ger-2022-0003>.

Juster, F.T. and Stafford, F.P. (1991) 'The allocation of time: Empirical findings, behavioral models, and problems of measurement', *Journal of Economic literature*, 29(2), pp. 471–522.

Kalenkoski, C.M., Hamrick, K.S. and Andrews, M. (2011) 'Time poverty thresholds and rates for the US population', *Social Indicators Research*, 104(1), pp. 129–155. Available at: <https://doi.org/10.1007/s11205-010-9732-2>.

Kreimer, M. (2004) 'Labour market segregation and the gender-based division of labour', *European Journal of Women's Studies*, 11(2), pp. 223–246. Available at: <https://doi.org/10.1177/1350506804042097>.

Liu, J., Qi, L. and Xiong, Y. (2022) 'Non-parental childcare services and time allocation of mothers with young children in China', *Feminist Economics*, 28(2), pp. 303–328. Available at: <https://doi.org/10.1080/13545701.2021.2006736>.

López-Chávez, A. and Ortiz-Ávila, E. (2024) 'Childcare tasks in dual-earner couples with children under 14 years old in mexico, 2019', *Nóesis. Revista de ciencias sociales*, 33(66), pp. 39–56.

Luo, M.S. and Chui, E.W.T. (2018) 'Gender division of household labor in China: Cohort analysis in life course patterns', *Journal of Family Issues*, 39(12), pp. 3153–3176. Available at: <https://doi.org/10.1177/0192513X18776457>.

Marter-Kenyon, J.S. *et al.* (2023) 'Who has the time? A qualitative assessment of gendered intrahousehold labor allocation, time use and time poverty in rural senegal', *Frontiers in Sustainable Food Systems*, 7, p. 1198290. Available at: <https://doi.org/10.3389/fsufs.2023.1198290>.

Mattingly, M.J. and Sayer, L.C. (2006) 'Under pressure: Gender differences in the relationship between free time and feeling rushed', *Journal of Marriage and Family*, 68(1), pp. 205–221. Available at: <https://doi.org/10.1111/j.1741-3737.2006.00242.x>.

Mitchell, K., Marston, S.A. and Katz, C. (2003) 'Introduction: Life's work: an introduction, review and critique', *Antipode*, 35(3), pp. 415–442. Available at: <https://doi.org/10.1111/1467-8330.00333>.

National Bureau of Statistics of China (2021) Final Statistical Monitoring Report on the Implementation of China National Program for Women's Development (2011–2020). Available at: https://www.stats.gov.cn/english/PressRelease/202112/t20211231_1825801.html

National Bureau of Statistics of China (2021) Main Data of the Seventh National Population Census. Available at: https://www.stats.gov.cn/english/PressRelease/202105/t20210510_1817185.html

National Bureau of Statistics of China (2022) National Economy Continued to Recover with Major Indicators Generally Improving in August. Available at: https://www.stats.gov.cn/english/PressRelease/202209/t20220916_1888308.html

National Bureau of Statistics of China (2024) Communiqué on China's Third National Time Use Survey (No. 3). Available at: https://www.stats.gov.cn/english/PressRelease/202411/t20241115_1957437.html

National Bureau of Statistics of China (2025) Statistical Communiqué of the People's Republic of China on the 2024 National Economic and Social Development. Available at: https://www.stats.gov.cn/english/PressRelease/202502/t20250228_1958822.html

Nie, P. and Sousa-Poza, A. (2018) 'Commute time and subjective well-being in urban China', *China Economic Review*, 48, pp. 188–204.

Nikolov, P. and Adelman, A. (2019) 'Do private household transfers to the elderly respond to public pension benefits? Evidence from rural China', *The Journal of the Economics of Ageing*, 14, p. 100204.

Piasna, A. and Drahokoupil, J. (2017) 'Gender inequalities in the new world of work', *Transfer: European Review of Labour and Research*, 23(3), pp. 313–332. Available at: <https://doi.org/10.1177/1024258917713839>.

Qi, L. and Dong, X. (2016) 'Unpaid care work's interference with paid work and the gender earnings gap in China', *Feminist Economics*, 22(2), pp. 143–167. Available at: <https://doi.org/10.1080/13545701.2015.1025803>.

Qi, L. and Dong, X. (2018) 'Gender, low-paid status, and time poverty in urban China', *Feminist Economics*, 24(2), pp. 171–193. Available at: <https://doi.org/10.1080/13545701.2017.1404621>.

Rao, J.N. and Scott, A.J. (1984) 'On chi-squared tests for multiway contingency tables with cell proportions estimated from survey data', *The Annals of statistics*, pp. 46–60.

Rao, S. et al. (2024) 'Work and social reproduction in rural India: Lessons from time-use data', *Journal of Agrarian Change*, 24(3), p. e12569. Available at: <https://doi.org/10.1111/joac.12569>.

Rapoport, B., Sofer, C. and Solaz, A. (2011) 'Household production in a collective model: Some new results', *Journal of Population Economics*, 24(1), pp. 23–45. Available at: <https://doi.org/10.1007/s00148-010-0308-x>.

Reid, M.G. (1934) 'Economics of household production', (*No Title*) [Preprint]. Available at: <https://cir.nii.ac.jp/crid/1971712334696265484> (Accessed: 6 August 2026).

Ribeiro, L.L. and Marinho, E. (2012) 'Time poverty in Brazil: Measurement and analysis of its determinants', *Estudos Econômicos (São Paulo)*, 42(2), pp. 285–306. Available at: <https://doi.org/10.1590/S0101-41612012000200003>.

Rodgers, Y.V.D.M. (2023) 'Time poverty: Conceptualization, gender differences, and policy solutions', *Social Philosophy and Policy*, 40(1), pp. 79–102. Available at: <https://doi.org/10.1017/S0265052523000389>.

Rubiano-Matulevich, E. and Viollaz, M. (2019) *Gender differences in time use: Allocating time between the market and the household*. World Bank, Washington, DC. Available at: <https://doi.org/10.1596/1813-9450-8981>.

Rubin, D.B. (1987) 'The calculation of posterior distributions by data augmentation: Comment: a noniterative sampling/importance resampling alternative to the data augmentation algorithm for creating a few imputations when fractions of missing information are modest: the SIR algorithm', *Journal of the American Statistical Association*, 82(398), pp. 543–546.

Sayer, L.C. (2005) 'Gender, time and inequality: Trends in women's and men's paid work, unpaid work and free time', *Social Forces*, 84(1), pp. 285–303. Available at: <https://doi.org/10.1353/sof.2005.0126>.

So, J.H.J. (2024) *Time poverty in the united states and south korea*. Columbia University. Available at: <https://search.proquest.com/openview/6ea30054f19bf880860bd0b102a7da52/1?pq-origsite=gscholar&cbl=18750&diss=y> (Accessed: 6 August 2026).

- Srivastava, A. and Floro, M.S. (2017) 'The dual problem of unemployment and time poverty in south africa: Understanding their linkages', in R. Connelly and E. Kongar (eds) *Gender and Time Use in a Global Context*. New York: Palgrave Macmillan US, pp. 193–230. Available at: https://doi.org/10.1057/978-1-137-56837-3_8.
- Sterne, J.A. *et al.* (2009) 'Multiple imputation for missing data in epidemiological and clinical research: Potential and pitfalls', *Bmj*, 338. Available at: <https://www.bmj.com/content/338/bmj.b2393/> (Accessed: 6 August 2026).
- Szollós, A. (2009) 'Toward a psychology of chronic time pressure: Conceptual and methodological review', *Time & Society*, 18(2–3), pp. 332–350. Available at: <https://doi.org/10.1177/0961463X09337847>.
- Van Buuren, S. and Groothuis-Oudshoorn, K. (2011) 'mice: Multivariate imputation by chained equations in R', *Journal of statistical software*, 45, pp. 1–67.
- Vickery, C. (1977) 'The time-poor: A new look at poverty', *The Journal of Human Resources*, 12(1), p. 27. Available at: <https://doi.org/10.2307/145597>.
- Warren, T. (2003) 'Class and gender-based working time? Time poverty and the division of domestic labour', *Sociology*, 37(4), pp. 733–752. Available at: <https://doi.org/10.1177/00380385030374006>.
- White, I.R., Royston, P. and Wood, A.M. (2011) 'Multiple imputation using chained equations: Issues and guidance for practice', *Statistics in Medicine*, 30(4), pp. 377–399. Available at: <https://doi.org/10.1002/sim.4067>.
- Williams, J.R., Masuda, Y.J. and Tallis, H. (2016) 'A measure whose time has come: Formalizing time poverty', *Social Indicators Research*, 128(1), pp. 265–283. Available at: <https://doi.org/10.1007/s11205-015-1029-z>.
- Wodon, Q. and Blackden, C.M. (eds) (2006) *Gender, time use, and poverty in sub-saharan africa*. The World Bank (World Bank Working Papers). Available at: <https://doi.org/10.1596/978-0-8213-6561-8>.
- Xie, Y. and Hu, J. (2014) 'An introduction to the China family panel studies (CFPS)', *Chinese sociological review*, 47(1), pp. 3–29.
- Yavorsky, J.E., Kamp Dush, C.M. and Schoppe-Sullivan, S.J. (2015) 'The production of inequality: The gender division of labor across the transition to parenthood', *Journal of Marriage and Family*, 77(3), pp. 662–679. Available at: <https://doi.org/10.1111/jomf.12189>.
- Zhai, F., Gao, Q. and Wang, X. (2020) 'Education and gender gap in couples' time use: Evidence from China', *Journal of Asian Public Policy*, 13(3), pp. 333–352. Available at: <https://doi.org/10.1080/17516234.2019.1632018>.
- Zhang, M., Wang, Y. and Hou, L. (2024) 'Gender norms and the child penalty in China', *Journal of Economic Behavior & Organization*, 221, pp. 277–291. Available at: <https://doi.org/10.1016/j.jebo.2024.03.011>.
- Zhao, Q. *et al.* (2024) 'Why do we never have enough time? Economic inequality fuels the perception of time poverty by aggravating status anxiety', *British Journal of Social Psychology*, 63(2), pp. 614–636. Available at: <https://doi.org/10.1111/bjso.12695>.
- Zilanawala, A. (2016) 'Women's time poverty and family structure: Differences by parenthood and employment', *Journal of Family Issues*, 37(3), pp. 369–392. Available at: <https://doi.org/10.1177/0192513X14542432>.

Appendix A. Additional tables for data analysis

Table A1. Multicollinearity diagnostics for the adjusted models

Predictor	GVIF	Df	Adjusted GVIF
Gender	1.041	1	1.020
Age	1.940	1	1.393
Partnership status	1.613	1	1.270
Presence of children under 16	1.153	1	1.074
Education	1.749	2	1.150
Hukou status	1.302	2	1.068
Work type	1.424	3	1.061
Self-rated health	1.136	4	1.016

Adjusted GVIF is $GVIF^{1/(2 \times Df)}$. Values are based on the main adjusted specification.

Table A2. Full survey-weighted OLS estimates for weekly time-use outcomes

Predictor	Paid work	Unpaid work	Total workload
Intercept	66.08*** (1.58)	5.57*** (1.46)	71.65*** (2.04)
Women	-4.65*** (0.55)	9.73*** (0.56)	5.08*** (0.71)
Age	-0.15*** (0.03)	0.10*** (0.03)	-0.04 (0.04)
Partnered	1.47* (0.73)	4.87*** (0.77)	6.33*** (1.04)
Child under 16	0.38 (0.57)	3.95*** (0.57)	4.34*** (0.74)
Secondary education	-0.77 (0.78)	-1.77* (0.81)	-2.54** (0.93)
Higher education	-7.41*** (0.97)	-1.77 (1.17)	-9.19*** (1.20)
Non-agricultural hukou	-4.67*** (0.90)	3.89*** (1.09)	-0.78 (1.06)
Resident hukou	-3.16*** (0.80)	3.19*** (0.81)	0.03 (1.05)
Family agricultural work	-19.01*** (0.83)	12.53*** (0.87)	-6.48*** (1.04)
Self-employed	-0.11 (1.08)	1.80* (0.79)	1.69 (1.28)
Agricultural wage work	-1.81 (1.41)	4.07** (1.52)	2.25 (2.02)
Health: very good	-0.70 (0.87)	-1.93 (0.99)	-2.63* (1.26)
Health: good	-0.08 (0.72)	-3.18*** (0.89)	-3.25** (1.11)
Health: fair	1.14 (1.12)	-4.59*** (1.16)	-3.46* (1.49)
Health: poor	1.50 (1.47)	0.27 (1.80)	1.77 (1.87)
N	10,642	10,642	10,642

Estimates are survey weighted and pooled across five multiply imputed datasets using Rubin's rules

Table A3. Full survey-weighted logistic regression estimates for time-poverty prevalence

Predictor	68.4-hour threshold	Weighted P75 threshold
Intercept	0.97 [0.69, 1.35]	0.20*** [0.14, 0.29]
Women	1.43*** [1.27, 1.60]	1.49*** [1.31, 1.70]
Age	1.00 [0.99, 1.01]	1.00 [0.99, 1.01]
Partnered	1.73*** [1.46, 2.05]	1.62*** [1.32, 2.00]
Child under 16	1.35*** [1.20, 1.52]	1.41*** [1.22, 1.63]
Secondary education	0.87 [0.75, 1.00]	0.85* [0.73, 0.99]

Table A3. Full survey-weighted logistic regression estimates for time-poverty prevalence

Predictor	68.4-hour threshold	Weighted P75 threshold
Higher education	0.43*** [0.35, 0.53]	0.38*** [0.29, 0.49]
Non-agricultural hukou	0.87 [0.73, 1.04]	0.98 [0.78, 1.23]
Resident hukou	0.89 [0.74, 1.06]	0.95 [0.77, 1.18]
Family agricultural work	0.57*** [0.49, 0.67]	0.86 [0.72, 1.03]
Self-employed	0.90 [0.74, 1.09]	1.42** [1.14, 1.76]
Agricultural wage work	0.90 [0.66, 1.22]	1.54** [1.13, 2.10]
Health: very good	0.84 [0.70, 1.01]	0.85 [0.69, 1.05]
Health: good	0.85* [0.73, 0.99]	0.83* [0.70, 0.99]
Health: fair	0.94 [0.74, 1.20]	0.74* [0.57, 0.97]
Health: poor	1.05 [0.83, 1.32]	1.14 [0.88, 1.50]
N	10,642	10,642

Estimates are survey weighted and pooled across five multiply imputed datasets using Rubin's rules

Table A4. Descriptive gender differences in FGT measures across family contexts

Context	Threshold	Measure	Men	Women	Women – Men [95% CI]	p-value
Panel A. Partnership status						
Unpartnered	68.4-hour	P0	41.30	33.70	-7.60 [-12.94, -2.25]	.005
Unpartnered	68.4-hour	P1	.103	.096	-.007 [-.033, .018]	.566
Unpartnered	68.4-hour	P2	.053	.070	.016 [-.029, .062]	.475
Unpartnered	Weighted P75	P0	14.84	13.37	-1.47 [-5.20, 2.27]	.441
Unpartnered	Weighted P75	P1	.029	.032	.003 [-.012, .018]	.683
Unpartnered	Weighted P75	P2	.014	.024	.011 [-.012, .034]	.363
Partnered	68.4-hour	P0	52.15	63.12	10.96 [8.00, 13.93]	< .001
Partnered	68.4-hour	P1	.166	.226	.060 [.041, .078]	< .001
Partnered	68.4-hour	P2	.108	.161	.053 [.023, .083]	.001
Partnered	Weighted P75	P0	24.02	32.86	8.85 [5.99, 11.70]	< .001
Partnered	Weighted P75	P1	.059	.085	.026 [.015, .038]	< .001
Partnered	Weighted P75	P2	.032	.052	.019 [.004, .034]	.011
Panel B. Presence of children under 16						
No child under 16	68.4-hour	P0	44.24	49.69	5.45 [0.83, 10.05]	.021
No child under 16	68.4-hour	P1	.124	.155	.031 [.009, .053]	.007
No child under 16	68.4-hour	P2	.072	.092	.020 [-.004, .045]	.106
No child under 16	Weighted P75	P0	17.59	23.22	5.63 [1.53, 9.74]	.007
No child under 16	Weighted P75	P1	.040	.052	.012 [.000, .024]	.055
No child under 16	Weighted P75	P2	.020	.025	.006 [-.005, .016]	.312
Has child under 16	68.4-hour	P0	52.91	62.61	9.70 [6.50, 12.90]	< .001
Has child under 16	68.4-hour	P1	.168	.232	.063 [.042, .085]	< .001
Has child under 16	68.4-hour	P2	.109	.178	.068 [.030, .107]	.001
Has child under 16	Weighted P75	P0	24.48	33.02	8.54 [5.56, 11.53]	< .001
Has child under 16	Weighted P75	P1	.059	.091	.032 [.018, .046]	< .001
Has child under 16	Weighted P75	P2	.033	.060	.027 [.008, .047]	.006

Unadjusted within-context comparisons. P0 is expressed in percentage points; P1 and P2 retain their original scales.

Table A5. Robustness of adjusted gender differences in weekly time use outcomes

Scenario	N	Paid work	Unpaid work	Total workload
Main analysis	10,642	-4.650 [-5.726, -3.574]***	9.733 [8.646, 10.821]***	5.083 [3.698, 6.468]***
Excluding workers without a fixed workplace	10,261	-4.894 [-5.985, -3.803]***	9.619 [8.522, 10.716]***	4.725 [3.313, 6.136]***
Complete-case sample	10,511	-4.703 [-5.786, -3.619]***	9.648 [8.552, 10.745]***	4.946 [3.559, 6.333]***
Excluding total workload above 168 hours	10,563	-4.755 [-5.772, -3.738]***	9.349 [8.357, 10.341]***	4.594 [3.363, 5.824]***
Wage-employee subsample				
controlling for log wage income	6,587	-3.450 [-4.730, -2.169]***	7.838 [6.374, 9.303]***	4.389 [2.830, 5.948]***

Table A6. Sensitivity of adjusted gender differences in time-poverty prevalence

Specification	N	Threshold	AME (pp)	95% CI	OR [95% CI]	p-value
Main analysis	10,642	68.4-hour	8.30	[5.68, 10.92]	1.43 [1.27, 1.60]	< .001
		Weighted P75	7.16	[4.80, 9.52]	1.49 [1.31, 1.70]	< .001
Fixed-workplace sample	10,261	68.4-hour	7.70	[5.04, 10.36]	1.39 [1.24, 1.56]	< .001
		Weighted P75	6.41	[4.06, 8.75]	1.43 [1.26, 1.63]	< .001
Complete-case sample	10,511	68.4-hour	8.00	[5.39, 10.60]	1.41 [1.26, 1.58]	< .001
		Weighted P75	7.16	[4.87, 9.45]	1.49 [1.31, 1.69]	< .001
Workload ≤ 168 h	10,563	68.4-hour	8.23	[5.59, 10.86]	1.42 [1.27, 1.59]	< .001
		Weighted P75	7.15	[4.82, 9.48]	1.49 [1.31, 1.70]	< .001
Wage employees + log income	6,587	68.4-hour	7.72	[4.36, 11.07]	1.41 [1.21, 1.63]	< .001
		Weighted P75	7.21	[4.21, 10.22]	1.50 [1.27, 1.78]	< .001

Table A7. Sensitivity of descriptive FGT gender differences

Specification	N	Threshold	P0 difference [95% CI]	P1 difference [95% CI]	P2 difference [95% CI]
Main analysis	10,642	68.4-hour	7.97*** [5.31, 10.62]	.050*** [.034, .066]	.049*** [.024, .074]
		Weighted P75	7.36*** [4.96, 9.76]	.024*** [.014, .033]	.019** [.006, .031]
Fixed-workplace sample	10,261	68.4-hour	7.80*** [5.10, 10.51]	.048*** [.032, .065]	.047*** [.021, .073]
		Weighted P75	6.92*** [4.50, 9.35]	.022*** [.013, .032]	.018** [.005, .030]
Complete-case sample	10,511	68.4-hour	7.70*** [5.04, 10.36]	.049*** [.033, .064]	.048*** [.022, .074]
		Weighted P75	7.35*** [4.99, 9.70]	.023*** [.013, .033]	.018** [.006, .031]
Workload ≤ 168 h	10,563	68.4-hour	7.83*** [5.17, 10.50]	.042*** [.029, .054]	.027*** [.016, .037]
		Weighted P75	7.18*** [4.80, 9.57]	.018*** [.011, .025]	.007*** [.003, .011]
Wage employees + log income	6,587	68.4-hour	7.00*** [3.56, 10.43]	.041*** [.023, .059]	.037* [.005, .069]
		Weighted P75	6.83*** [3.73, 9.94]	.019** [.008, .031]	.015 [-.002, .033]

Appendix B. Additional figures for data analysis

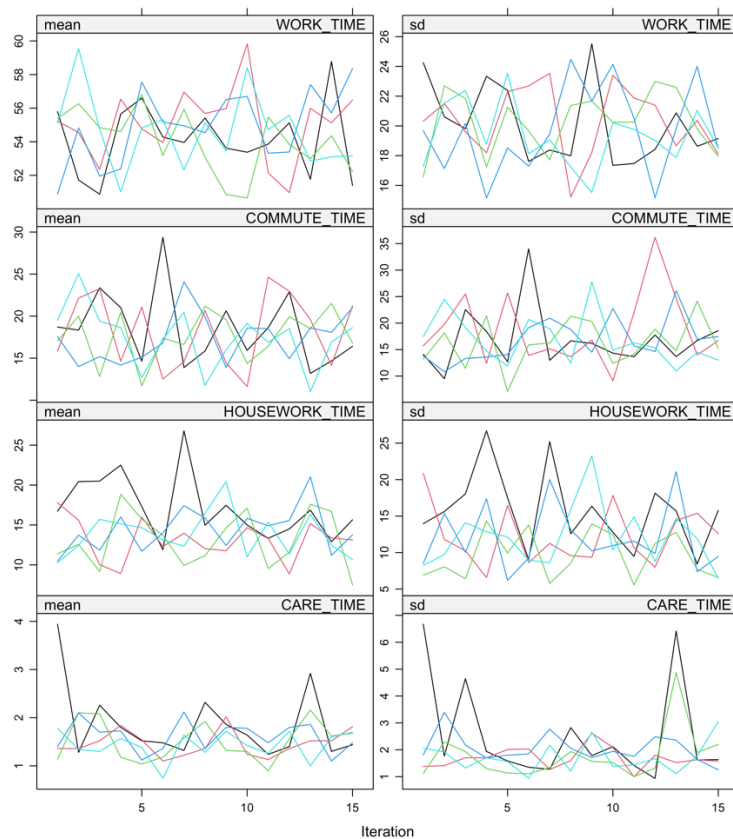


Figure B1. Convergence diagnostics for multiple imputation of time-use variables

Observed and imputed distributions of time variables

Commuting is restricted to fixed-workplace respondents; care is restricted to multi-person households

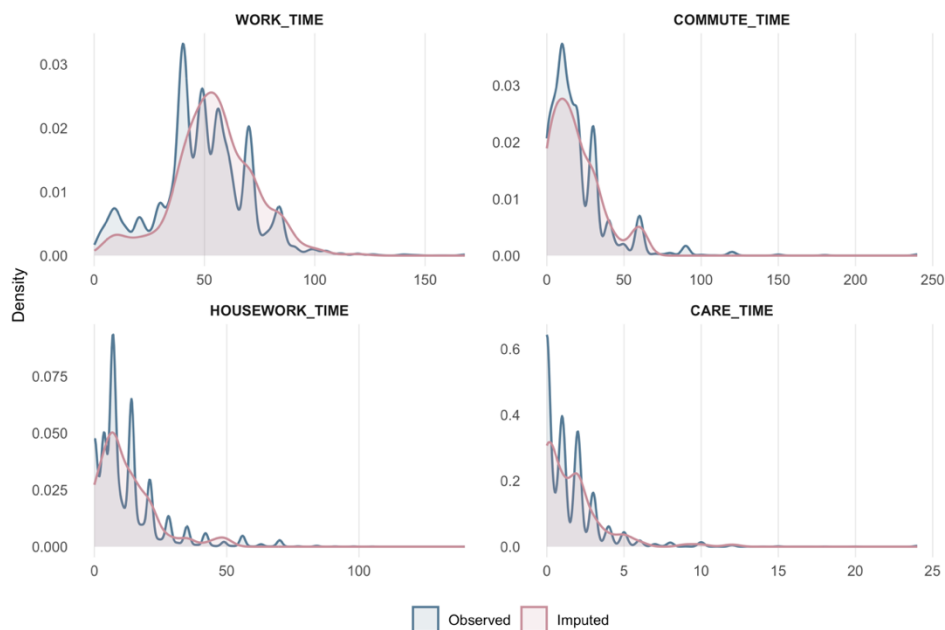


Figure B2. Observed and imputed distributions of time-use variables

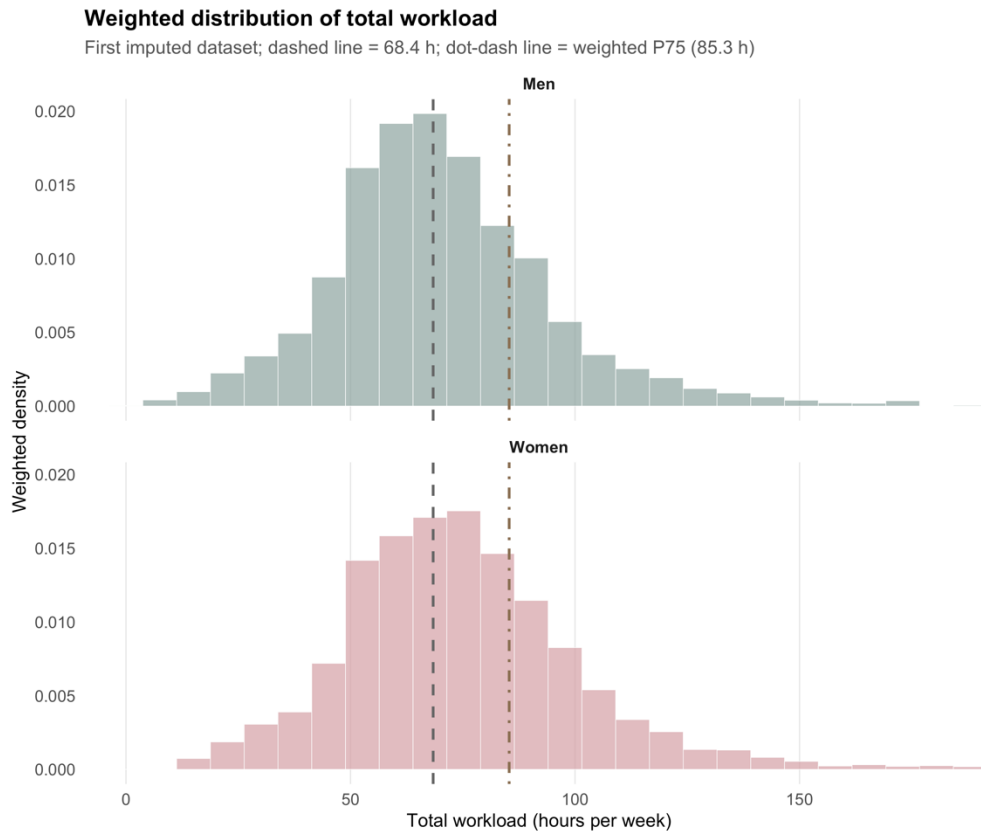


Figure B3. Weighted distributions of total workload by gender and time-poverty threshold

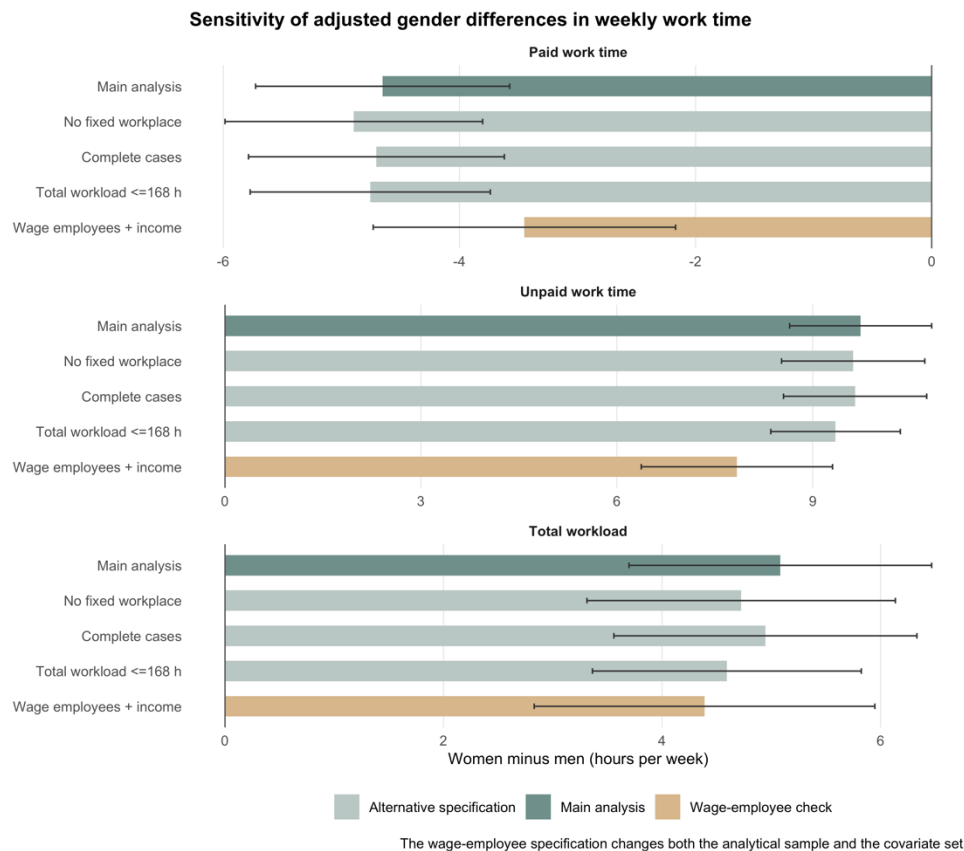


Figure B4. Sensitivity of adjusted gender differences in weekly time-use outcomes

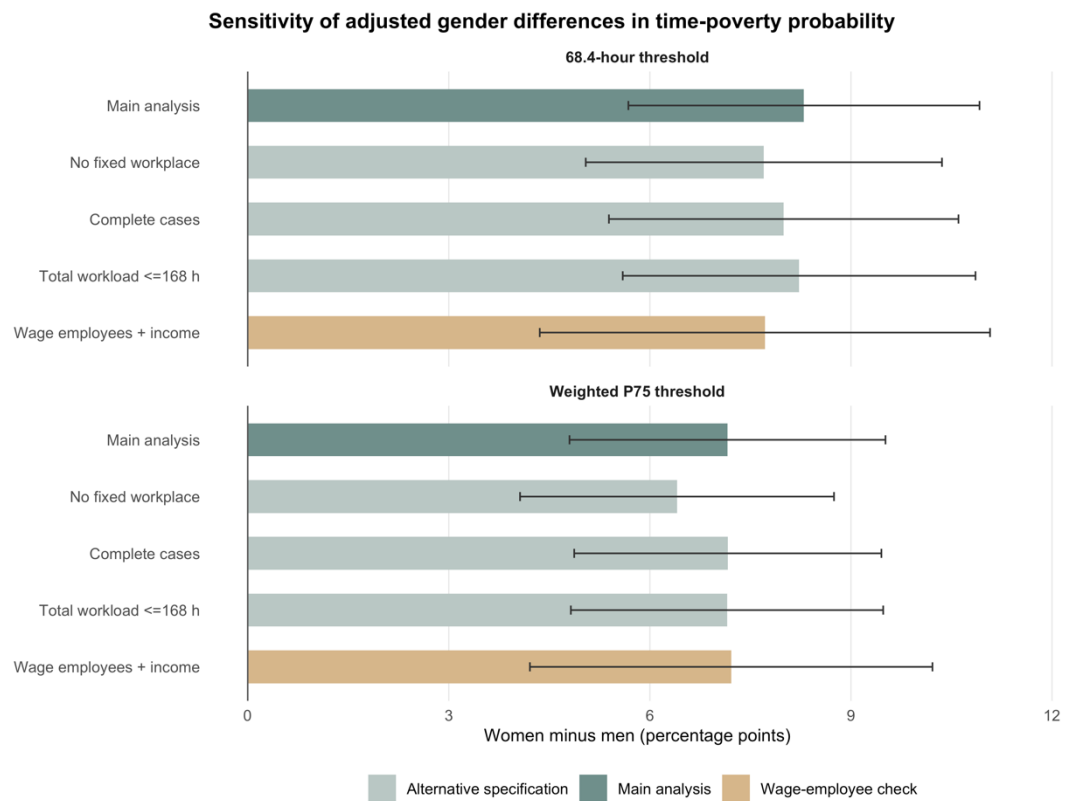


Figure B5. Sensitivity of adjusted gender differences in time-poverty prevalence