The Impact of the Number of Children on Parental Labor Market Performance[1]

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Abstract

Against the backdrop of China's implementation of the "universal two-child" policy, the expansion of higher education, and the narrowing gender gap in the labor market and family status, we investigated the impact of the number of children on parental labor supply and occupational prestige scores using data from the China Family Panel Studies (CFPS) for 2016 and 2018. We found that the influence of children on the parental labor market shifted from labor supply to occupational prestige scores. Heterogeneity analysis reveals a more negative significant adverse impact of younger children on parental labor market performance compared with children over 7 years old. Compared to rural areas, parents in urban areas experience a more significant negative impact from an increase in the number of children. Extended families facilitate rural fathers' employment and leads to a decline in occupational prestige for urban parents.

1. Introduction

Since the implementation of the one-child policy in 1979, China has been facing increasingly severe issues of declining birth rates and an aging population, leading to a growing shortage of labor force. To address the challenges of declining birth rates and population aging, and mitigate the declining proportion of the labor force, China has been gradually liberalizing its fertility policy since 2011. In 2015, the 'Universal Two-child Policy" was implemented, allowing all couples to have a second child regardless of their birth order. The 'China Health and Family Planning Statistical Yearbook 2019' shows that the proportion of second-child births in Chinese families increased from 40.2% in 2016 to 59.5% in 2019. The gradual implementation of these fertility policies has contributed to an increase in the number of children in China.

At the same time, the process of gender equality has advanced rapidly in China since 1999, when the country implemented the expansion of higher education to improve the quality of its labor force. The expansion of higher education and the advancement of the gender equality process have promoted the position of women in the labor market and the household.

The proportion of women in the workforce has been steadily rising, and the gender gap in occupational prestige scores has gradually narrowed. According to the 'China Labor Statistical Yearbook', the proportion of urban employed women in China increased from 37.2% in 2010 to 40% in 2020. The gender difference in occupational prestige scores in China decreased from 4.33 in 1990 to 0.39 in 2020, indicating an expansion of career choices for women in the labor market. Gender disparities in the labor market are gradually diminishing.

In terms of family status, the equality of spouses' roles in the family is increasing. According to surveys conducted in the 'Survey on the Social Status of Women in China' in 1990 and the 'China National Time Utilization Survey Report' in 2018, the average daily household chores time difference between spouses decreased from 2.28 to 1.31 hours, with urban households showing a greater reduction compared to rural ones.

The purpose of our study is to examine the effect of the number of children in the household on parents' labor participation and occupational prestige scores using CFPS data from 2016 and 2018. We also compare the results of the study with Chen et al.'s (2021) analyses of the period of the "One-Child" policy implemented in 1990 in Taiwan and China. To observe how the effect of children on parents' labor market performance has changed in the new era and policy context.

Children's influence on their parents' labor market performance is tied to family well-being. Firstly, in terms of the family economy, changes in the number of children affect the family economy to some extent. An increase in the number of children reduces the mother's labor supply, resulting in a decrease in the family's labor income. According to the consumption smoothing theory, to ensure that the family balances its income and expenditure, fathers will increase their own labor supply to alleviate the financial burden that an increase in the number of children brings to the family (Ukil, 2015; He & Zhu, 2016; Tan, 2021; Lafuente et al., 2023; Guo et al., 2018; Tharenou,1999; Lundgerg and Rose,2002). Next is family happiness. Since ancient times, China has had the traditional family ideology of "many children, many blessings" and "having son and daughter at the same time". An increase in the number of children in a family will raise the psychological well-being of the parents. It is necessary that we study the impact of children on the labor market performance of their parents at the family level. This concerns the well-being of workers in the labor market and in the family.

From previous research, women consistently face the challenge of balancing work and family responsibilities, often experiencing an impact on labor hours and income due to caregiving obligations, with a significant inhibitory effect of increasing children on mothers in the labor market (Ukil, 2015; He & Zhu, 2016; Tan, 2021; Lafuente et al., 2023; Guo et al., 2018).

At the same time, there is significant heterogeneity in the effect of children on mothers' labor supply. Zhang (2017) showed that as the sequence of births increased, the penalty of children on the mother's labor supply decreased. Nazah et al. (2021) suggested that the inhibitory effect of children on mothers' labor market outcomes diminishes or even disappears as children grow older. Aaronson et al. (2020) proposed that in regions with low economic development, children exhibit no discernible impact on mothers' labor supply. However, as economic development levels rise, an adverse effect on mothers' labor supply becomes apparent. The impact of children on parents' labor market performance is closely related to the presence of elderly people in the household (Cardia & Ng, 2003; Cao & Lee, 2019). When living with grandparents, grandparents provide intergenerational support to mothers to some extent (financial assistance or help with childcare), which somewhat reduces the burden of caring for children and household finances on mothers. However, the presence of elderly grandparents in the household exacerbates the burden on the mother's family care and household income and expenditure.

The impact on fathers is minimal, with some studies suggesting that fatherhood may even contribute to career advancement and increased income. In a comparative analysis of data from Taiwan and mainland China in 1990,

Chen et al. (2021) observed that an expansion in family size adversely affects mothers' labor supply in both regions. Interestingly, this increase in family size doesn't influence fathers' labor supply. Tharenou (1999) contends that children contribute to fathers' career progression, often causing disruptions in mothers' employment trajectories. Additionally, Lundgerg and Rose (2002) pointed out that assuming a fatherhood identity significantly boosts male hourly wage rates and annual working hours.

Through a review of prior studies, we find that there is a significant gender difference in the number of children in a Chinese household on the labor supply of parents. There is a significant inhibitory effect of children on mothers' labor supply, and not significant on fathers' labor supply. At the same time, we also find drawbacks in the prior studies. Existing prior research in China mainly discusses the effects of children on parents' income, working hours, and labor force participation. There is a relative gap in research on the effect of children on parents' occupational choice preferences. Second, few studies consider the impact of children on parental labor supply at the level of family status.

There is a reverse causal relationship between the number of children and parental labor supply. The number of children affects the performance of parents in the labor market. At the same time, parents who perform positively in the labor market will choose to have fewer children to make their labor supply less punished by their children. Due to the reverse causality problem, we would have endogeneity issues using OLS analysis directly and lead to biased analysis. We refer to Chen et al.'s (2021) research model and use whether the firstborn child in the family is a twin as an instrumental variable to build a 2SLS model to address the endogeneity issues. Whether the firstborn child is a twin directly affects the number of children in the household, but there is no direct effect on parental labor supply and occupational prestige scores. Moreover, twins are chance event and satisfy objective conditions. Therefore, we use twins as an instrumental variable to satisfy exogeneity, and the analyses obtained are robust and objective.

The results of our analysis show that when the number of children in the family increases by 1 unit, the mother's labor supply decreases by 9.8% and her occupational prestige score decreases by 3.39 points. Fathers' labor supply is unaffected by an increase in the number of children, and one unit increase in the number of children decreases fathers' occupational prestige score by 3.28 points. The results of our analysis are different from Chen et al. (2021), who used data from Taiwan and mainland China in 1990 to analyze the effect of the number of children on parental labor market performance, and showed that an increase in the number of children in

mainland China reduces parents' labor supply and has no effect on parents' occupational prestige scores. The reason for the difference between our results and Chen et al. (2021) is the narrowing of gender differences in the Chinese labor market and the increasing equality of the status of couples and families.

We build on the results of Chen et al.'s (2021) analysis by adding additional heterogeneity analyses in terms of child's age, level of economic development, and family size. The impact of the number of children on parental labor market performance is analyzed in depth from multiple perspectives

There are two main differences in our study compared to previous research: firstly, the impact of children on parental income, working hours and labor force participation has been mainly discussed in prior research. There is a relative gap in research on the impact of children on parents' occupational choice preferences. By analyzing the effect of the number of children on parents' labor market performance, we can see not only changes in parents' labor supply due to changes in the number of children but also changes in parents' occupational choices. Second, few correlates in terms of parental family status have been considered in prior studies. We control parents' average daily housework hours and obtain different findings from Chen et al. (2021) by measuring parents' family status through their average daily housework hours. When both parents participate in household chores, children not only affect the mother's labor market performance but also reduce the father's occupational prestige score.

Our results enrich research on the labor supply side to some extent. From the perspective of occupational prestige scores, we observe that an increase in the number of children significantly affects parents' occupational choices, providing a new perspective for future research on the impact of children on parental labor supply. At the same time, we measured the status of parents in the family through the time spent on household chores and obtained different results from previous studies, and the change in the status of parents in the family is a factor that we cannot ignore in future studies at the family level.

The remaining content of our study is as follows: Section 2 describes China's current situation. Section 3 is the data and model. Section 4 is the empirical analysis, observing the impact of the number of children on parental labor market performance from multiple perspectives. Section 5 is the conclusion.

2. China's Current Situation

Occupational Prestige Score (OPS) is a quantitative measure assessing the perceived status and respect associated with a particular profession. It reflects societal attitudes toward different occupations, considering factors such as expertise, social impact, and educational requirements. Derived from surveys and public perception, OPS provides insights into the hierarchical positioning of various careers. According to the Standard International Occupational Prestige Scale (SIOPS) criteria, occupations are divided into 5 levels, a higher OPS suggests greater societal regard and admiration for a profession. With higher-prestige jobs requiring more occupational skills, longer professional training, higher educational levels, and greater responsibilities. High occupational prestige also represents higher income and greater societal rewards. Policymakers, researchers, and educators often use OPS to understand societal values, inform career guidance, and address issues related to occupational prestige. It serves as a valuable tool for analyzing and comparing the social standing of different professions within a given community or across diverse cultures.
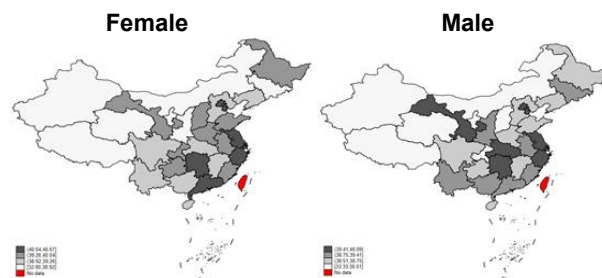
Why do we focus on occupational prestige scores rather than wages or working hours? Firstly, maternity does not directly affect mothers' wages because China's maternity leave system protects the stability of mothers' wages. Second, occupational prestige scores reflect occupational mobility to some extent, compared to hours worked.

In theory, the number of children can have both positive and negative impacts on parental labor market performance. On one hand, an increase in the number of children may reduce the labor market participation and career development of mothers (or fathers). After childbirth, mothers may take maternity leave or focus more on childcare, leading to temporary exits from the labor market or reduced labor supply. To mitigate the negative impact of increased childcare responsibilities, mothers may seek occupations with lower occupational prestige scores to maintain their labor supply. In the face of increased family pressure due to the number of children, fathers may lower their occupational prestige scores to gain more job opportunities and increase their income, thus alleviating economic pressure.

On the other hand, an increase in the number of children can have a positive impact on parental labor market performance. It may encourage parents to have higher career aspirations and pursue occupations with higher occupational prestige scores, thereby providing a better living environment and higher social status for their children.

Figure 1 displays the distribution of average occupational prestige scores in China in 2018, showing minimal gender differences. In contrast, the distribution of occupational prestige scores in mainland China in 1990 revealed significant gender differences (Chen et al., 2021). This shift indicates that China is moving away from gender bias in the professional field.

Figure 1: The distribution of average occupational prestige scores in 2018 China**.**

The transformation of gender equality in parental family roles challenges traditional beliefs. As shown in Table 1, from 1990 to 2018, the difference in daily average household chore time between parents has continually decreased, with fathers gradually participating in household labor. According to the characteristics of household chore distribution in Chinese families in 2015, 52.8% of Chinese families reported that chores were done jointly by spouses. This suggests that in Chinese families, half of the parents share equal roles in household responsibilities (Niu, 2020).

Table 1: Average daily household chores time of parents in Chinese families

（**hours/day**）

Year	Father	Mother	Difference
All			
1990	1.58	3.86	2.28
2008	1.15	3.18	2.03
2018	0.75	2.06	1.31
Urban			
1990	2.16	4.35	2.19
2008	1.42	3.22	1.80
2018	0.72	1.92	1.2
Rural			
1990	2.23	5.18	2.95
2008	0.87	3.13	2.26
2018	0.83	2.42	1.59

Note: Data is sourced from 'Survey on the Social Status of Women in China' in 1990, 'China National Time Utilization Survey Report' in 2008 and 2018.

We discuss in detail in the next section how the number of children in a Chinese family affects the labor market performance of parents in the new era and policy context.

3. Data and Model

3.1. Data

The China Family Panel Studies (CFPS) database is the largest longitudinal social science survey in China, established by the Peking University Institute of Social Science Survey. It encompasses multidimensional data on households nationwide, including economic, social, and educational aspects, offering valuable resources for in-depth insights into China's societal changes and family dynamics.

We utilize data from the China Family Panel Studies (CFPS) of 2016 and 2018 to study the impact of the number of children on parental labor market performance among parents aged 21-45. We chose the samples from 2016 and 2018 due to significant changes in the research context compared to 1990. These changes include policy shifts, such as the implementation of the "universal two-child" policy in 2015, which has led to an increase in the number of children in Chinese families. Additionally, the expansion of higher education in China since 1999 has significantly improved the education level of parents. Gender differences in occupational prestige scores have been continuously shrinking and the status of women in the labor market has improved compared to 1990. Finally, the increasing equality of spousal family status in China is manifested in the narrowing gap in daily household chores time between spouses from 1990 to 2018. Thus, we use the samples of 2016 and 2018 in comparison with the findings of the 1990 Chen et al. (2021) study is characterized by distinctive changes in social, policy and family contexts.

The basic statistical data for our analyses is in Table 2. Total 15575 sample families. Based on Table 2, it can be observed that there are gender differences in labor supply, with mothers having 10.7% less than fathers. The difference in parental OPS (Occupational Prestige Score) is not very pronounced with mothers having an average OPS of 0.4 lower than fathers. The proportion of parents completing middle school and above is 65.6% and 71.9%. In the household, the average number of children is 1.66. The probability of the first birth being twins is 0.93%. The twin's birth rate exceeding 0.58% in 1990 is due to advancements in artificial fertilization techniques, which have increased the likelihood of successful twin

pregnancies. The probability that at least one child under 7 years old is 49.4%. The difference in average time spent by parents on household chores[2] per day is 1.31 hours, indicating that there is not a significant gap in parental roles within the family.

Table 2: Basic data

	Mean	S.D.
Mother		
Labor supply(1/0)	.860	.345
Occupational prestige scores	39.03	11.40
Age	35.41	6.32
Age at first birth	24.18	3.31
Education level	.656	.475
Housework hours	2.69	1.87
Father		
Labor supply(1/0)	.967	.179
Occupational prestige scores	39.43	10.89
Age	35.94	5.97
Age at first birth	25.85	3.62
Education level	.719	.449
Housework hours	1.38	1.36
Household		
Number of children	1.66	.740
Twin	.009	.096
Baby	.494	.500
Observations	15575	

Note: Data source 2016, 2018 CFPS. Sample age focuses on married parents of childbearing age between 21-45 years old. Labor supply is a dummy variable that indicates one if the parent is employed, and 0 otherwise. Twin is a dummy variable indicates one if the firstborn two children were born in the same year and same month, and 0 otherwise. Baby is a dummy variable that is 1 if at least one child in the household is under 7 years old, and 0 otherwise. Education level is a dummy variable that is 1 if parents

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[2] Household chores include household cleaning (such as room tidying, furniture dusting, floor cleaning, etc.), laundry (washing, hanging, folding clothes, etc.), cooking and meal preparation (grocery shopping, meal cooking, dishwashing, etc.), caring for family members (taking care of children, elderly care, attending to sick family members, etc.), shopping and household management (buying daily necessities, managing household finances, handling household affairs, etc.), and other household activities.

with 9 or more years of education, and 0 otherwise. Housework hours are the hours that parents do their daily chores in the household.

3.2. Model

We refer to Chen et al.'s (2021)[3] empirical model to investigate the effect of the number of children on parental labor market performance, we develop the following model:

$$Y_{itj} = \beta_0 + \beta_1 Childrennumber_{ijt} + \beta_2 X_{ijt} + \gamma_j + \delta_t + \varepsilon_{ijt} \qquad (1)$$

Y_{ijt} denotes the labor market performance of parents in household i in province j at time t, including labor supply dummy variable and occupational prestige score. $Childrennumber_{ijt}$ denotes the number of children in household i in province j at time t. X_{ijt} is a control variable that includes the parents' age, and parents' age squared, parents' age at first birth, educational level of parents, whether at least one child in the family is under 7 years of age and whether parents do household chores every day[4]. γ_j is province-fixed effect. δ_t is year-fixed effect.

There is a reverse causal relationship between the number of children and parental labor supply. Using prior research, we find that an increase in the number of children affects the parental labor supply. At the same time, parental labor supply also affects the family's fertility decisions. When parents focus more on their career development and seek a higher quality of life, they choose to have fewer or no children to avoid the impact of children on their labor supply. The presence of reverse causality leads to endogeneity problems in the results of OLS analysis

Because of the reverse causality between the number of children and parental labor supply. The OLS results are biased. We continue to use 'Twin' as an instrumental variable in the Chen et al. (2021) study to address the endogenous issue. We build 2SLS model. The First-stage model as follow:

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[3] Chen, C., Zhao, W., Chou, S. & Lien, H. (2021). The effect of family size on parents' labor supply and occupational prestige: Evidence from Taiwan and Mainland China. *China Economic Review*, 66(*April*), 7-8.

[4] According to Charmes (2019), used data from 75 countries, the average daily unpaid caregiving labor time for women is 272 minutes, while for men is 84 minutes. Combining this with the 2018 China Family Panel Studies (CFPS) and Table 1 data, we set parental household chores participation as a dummy variable. If the average daily household chores time for parents is between 1-3 hours, the value is set to 1; otherwise is set to 0. This approach allows us to eliminate extreme cases where parents do no household chores or one party bears the entire burden of household chores.

$$Childrennumber_{itj} = \alpha_0 + \alpha_1 Twin_{ijt} + \alpha_2 X_{ijt} + \gamma_j + \delta_t + \varepsilon_{ijt} \qquad (2)$$

$Twin_{ijt}$ s a dummy variable indicating that the first two children in household i in province j at time t are born in the same year and the same month with 1, and 0 for the others. Other variables are the same as above.

Twins have a direct impact on the number of children in the family and the birth of twins significantly increases the number of children in the family as shown in the results in Table 3. When the firstborn is twin, the number of children in the family increases by 0.841 units. However, twins do not directly affect parents' labor supply and occupational prestige scores. Moreover, twins are chance event, which has a degree of objectivity. Therefore, our use of twins as an instrumental variable is satisfying exogeneity and exclusivity.

Underidentification test results strongly reject the null hypothesis, indicating that the instrumental variables are highly identifiable. The weak identification test results exceed the 10% critical value, indicating that the instrumental variables are not weak instruments. Durbin Wu-Hausman test indicates that the number of children is an endogenous variable. Therefore, we use 'Twin' as an instrumental variable in the 2SLS regression results is reliable.

Table 3: Result of the First-Stage

	First stage
Twin	.841***
	(.075)
Klelbergen-Paap rk LM statistic	18.47***
Klelbergen-Paap rk Warld F statistic	124.69(>16.38)
Durbin wu-hausman p-val	.033
	.012
Control variables	Y
Province fixed effect	Y
Year fixed effect	Y

Note: Standard errors shown in parentheses are clustered by province-year level.* p<0.1 **p<0.05 ***p<0.01

4. Results and Discussion

Table 4 compares the regression results between OLS and 2SLS. The results indicate that the OLS results are biased due to endogeneity issues. Our estimation results

further corroborate the findings of Zhang (2017). We will proceed with the analysis using the 2SLS model for all subsequent examinations.

The results of 2SLS show that the increase in the number of children has a negative effect on mothers' labor market performance and fathers' occupational prestige scores. When the number of children increases by one unit, the mother's labor supply decreases by 9.8%, and her occupational prestige score decreases by 3.39 points. The father's occupational prestige score decreased by 3.28 points. Compared to fathers, the mother's occupational prestige (OPS) declines more rapidly with an increase in the number of children. In Chen et al. (2021), when analyzing data from China in 1990, it was found that in mainland China, an increase in the number of children only reduced the parents' labor supply. The parents' OPS were not affected by the increase in children, which differs from our results.

There are two reasons for this: Firstly, we consider parents' involvement in household chores. With the narrowing of the gap in household chores time in Chinese families (In Section 2), parental roles are also changing. The fathers' role in the family is gradually becoming apparent. Therefore, an increase in children will also affect the father.

Secondly, China was relatively underdeveloped in 1990, and parents had limited opportunities for occupational choices. According to Chen et al, (2021), there were significant regional and gender differences in the distribution of occupational prestige scores in 1990. In Section 2, we describe the distribution of occupational prestige scores in 2018 China. Although regional differences still exist, the gender difference in occupational prestige scores is minimal. With the vigorous development of the economy, employment opportunities for workers continue to increase, especially for women. In this economic background, parents have more opportunities for occupational choices, parents' occupational prestige scores and the mobility of parents' occupations has increased. Faced with an increase in children, parents can balance work and life by lowering their occupational prestige scores.

By comparing the results of Chen et al.'s (2021) analysis, we find that the child's penalty for parental labor market performance shifts from labor supply to occupational prestige score. As China's labor market development and parents' occupational choices increase, this suggests that when the number of children increases, parents (especially mothers) maintain their labor supply and trade-off time spent in childcare by lowering their occupational prestige scores. There were large gender differences in China's labor market in 1990, as shown by the 1990 occupational prestige distribution graph in Chen et al.

(2021). There are large gender differences in occupational prestige scores and women have limited occupational choices in the labour market. When the number of children increases, women choose to withdraw from the labor market to take care of their children due to the limitation of occupational choices and the influence of the traditional family ideology (male breadwinner, female homemaker). Family labor income will fall when the wife's labor supply decreases, and the increase in the number of children will also add to the pressure on the family economy. According to the consumption smoothing theory, men will actively increase the labor supply to maintain the balance of household income and expenditure. With the development of China's labor market and the spread of gender equality awareness, women have more occupational choices in the labor market, and the expansion of higher education has increased women's bargaining power in the labor market. Women can mitigate the punishment of their children's labor supply by changing jobs (lowering their occupational prestige score). As women's labor quality improves, men no longer have a gender advantage in the labor market. Men can change jobs or increase the number of jobs they have in exchange for more income, thus alleviating the economic pressure on the family due to the increase in the number of children.

Table 4: OLS and 2SLS estimates of the effects of the number of children on parental labor market performance.

	Mother	Father
	Labor Supply(OLS)	
Children number	-.017**	-.004
	(.007)	(.003)
	OPS (OLS)	
Children number	-.734**	-.706**
	(.329)	(.270)
Control variables	Y	Y
Province fixed effect	Y	Y
Year fixed effect	Y	Y
	Y	Y
	Labor Supply (2SLS)	
Children number	-.098*	-.017
	(.036)	(.031)
	OPS (2SLS)	
Children number	-3.39**	-3.28**
	（1.39)	(1.36)

Control variables	Y	Y		
Province fixed effect	Y	Y		
Year fixed effect	Y	Y		

Note: Standard errors, reported in parentheses, are adjusted for clustering by province and year. * p<0.1 **p<0.05 ***p<0.01

Province fixed effect	Y	Y	Y	Y
Year fixed effect	Y	Y	Y	Y

Note: Standard errors shown in parentheses are clustered by province-year level. * p<0.1 **p<0.05 ***p<0.01

The age of the children affects parental labor decisions (Nazah et al., 2021). To further explore the impact of children on the parental labor market performance, we divided children into two groups based on the age of the firstborn child in the family, those aged 7 years old and below or above. When children are aged 7 years old and below, parents need to allocate more time and energy to care for and nurture them. Based on the results of the analysis in Table 5, we find that parental labor market performance is more significantly affected by the number of children when all children in the household are preschoolers. When the firstborn child is a preschooler, the number of children increases by one unit, the mother's labor supply decreases by 11.9%, OPS decreases by 4.27 points and the father's OPS decreases by 3.95 points. When there is no preschooler in the household, the number of children reduces only the mother's OPS. The results are consistent with the results of Nazah, Duasa, and Arifin (2021). The results suggest that parents take the needs of preschool children more into account when making labor supply decisions. Preschool children need more care from their parents, especially from their mothers. Comparing the results of the basic analysis, we find that mothers of preschool children have more reduced labor market performance.

Table 5: The effect of the number of children on parental labor market performance at first born child ages <=7 and >7 (2SLS)

	Families with the firstborn child <=7		Families with the firstborn child >7	
	Mother	Father	Mother	Father
	Labor Supply (2SLS)			
Children number	-.119*	-.043	-.059	-.002
	(.071)	(.036)	(.051)	(.032)
	OPS (2SLS)			
Children number	-4.27**	-3.95***	-2.77*	-2.55
	(2.03)	(1.22)	(1.59)	(1.92)
Control variables	Y	Y	Y	Y

As shown in the lower half of Table 6, the Labor supply, OPS and education levels of rural parents are significantly lower than those of urban parents. We divide the sample into urban and rural families and analyze how an increase in the number of children influences the labor market performance of parents under different economic and employment opportunity backgrounds.

The results in Table 6 show the effect of the number of children on the labor market performance of parents in urban and rural areas, and the results are highly heterogeneous. First, an increase in the number of children in urban areas significantly reduces the labour supply and OPS of mothers, but the results are not significant for mothers in rural areas. As noted by Aaronson et al. (2020), the effect of children on mothers is more severe in regions with higher levels of economic development. Second, an increase in the number of children decreases the OPS of fathers in urban areas and significantly increases the labor supply of fathers in rural areas.

The main reason for the urban and regional differences is the difference in the level of economic development and the status of the parents' family between urban and rural areas. According to the data at the bottom of Table 6, parents in urban areas have higher labor supply, labor force quality and occupational prestige scores than those in rural areas. This indicates that parents in urban areas have more employment opportunities and occupational choices than parents in rural areas. According to Table 1 in Section 2, the difference in average daily housework hours for couples in urban areas is smaller than in rural areas, which suggests that couples in urban areas are more equal in terms of family status than in rural areas. Family care is not only undertaken by mothers, but fathers are also gradually involved. Thus, the rise in the number of children in urban areas has a significant impact on the labor market performance of both parents. In rural areas, the traditional family ideology of "male breadwinner, female homemaker" is more often followed, with mothers taking on more of the role of family caregiver. Mothers in rural areas have lower educational level compare with urban areas, they have limited employment opportunities and occupational choices, they are not active in the labor market. Therefore, an increase in the number of children does not affect the labor market performance of mothers in rural areas. Fathers in rural areas, as the main source of

family income, are actively employed to increase their income when the number of children increases, to relieve the financial pressure on the family, and to maintain the family's balance of income and expenditure.

Table 6: The effect of the number of children on parental labor market performance in urban and rural(2SLS)

	Urban		Rural	
	Mother	Father	Mother	Father
	Labor Supply (2SLS)			
Children number	-.097**	-.046	-.010	.029***
	(.042)	(.052)	(.115)	(.008)
	OPS (2SLS)			
Children number	-4.32***	-4.17*	.560	-3.02
	(1.26)	(2.29)	(3.25)	(2.39)
Control variables	Y	Y	Y	Y
Province fixed effect	Y	Y	Y	Y
Year fixed effect	Y	Y	Y	Y
Labor supply	.864	.971	.855	.963
OPS	40.17	40.50	37.84	38.30
Educational Level	.801	.821	.498	.606

Note: Standard errors shown in parentheses are clustered

by province-year level. * p<0.1 **p<0.05 ***p<0.01

Through our previous research (Cao & Lee, 2019; Cardia & Ng, 2003), we found that the negative impact of the number of children on mothers' labor supply is somewhat alleviated when living with grandparents. However, living with grandparents presents another issue, which is whether the elderly individuals require care themselves. If grandparents require care, it may not only fail to alleviate the negative impact of having more children, but parents also have to assume the responsibility of caring for the elderly, requiring them to invest more time and energy in their family.

In this section, we focus our sample on families living with grandparents. Using the sample of co-residence with grandparents introduces endogeneity issues. This is because co-residing with grandparents directly may influence couples' fertility decisions and labor market performance. Therefore, we employed the family classification method proposed by Guo et al. (2018), dividing families into basic families (consisting of parents

and children) and extended families (including grandparents, parents, and children). We redefined the variable from whether co-residing with grandparents to whether grandparents are economically part of the household, namely the extended family sample. Ultimately, the sample size amounted to 5849.

Extended families can affect child-rearing in two ways. Firstly, grandparents in the household may assist with household chores and childcare, allowing parents to focus on their work. Conversely, the emergence of extended families may introduce new sources of stress for young parents; they may have to spend more time at home caring for both their children and grandparents (i.e., they may face a double burden). We introduced a virtual variable indicating whether grandparents are cared for to examine the analysis results of extended families.

Table 7: The effect of the number of children on parental labor market performance based on living with grandparents in urban and rural

	Urban		Rural	
	Labor Supply (2SLS)			
	Mother	Father	Mother	Father
Children number	-.113	-.011	-133	.030***
	(.103)	(.074)	(.199)	(.010)
	OPS (2SLS)			
Children number	-5.70**	-5.57*	-.514	-1.02
	(2.89)	(2.87)	(3.82)	(2.17)
Control Variables	Y	Y	Y	Y
Province fixed effect	Y	Y	Y	Y
Year fixed effect	Y	Y	Y	Y

Note: Standard errors shown in parentheses are clustered by province-year level. * p<0.1 **p<0.05 ***p<0.01

Comparing the results in Table 6 and Table 7, we find that the negative impact of the number of children on urban mother's labor market performance diminishes in extended families. The negative effect of the number of children on mothers' labor supply is no longer significant and the significance of the negative effect on mother's OPS decreases. The reason for this is that when living with grandparents, the grandparents provide some degree of intergenerational support (childcare or financial support) to the urban family, which reduces the pressure on urban mothers to raise and care for their children.

We also find a greater reduction in parental OPS in urban areas and an increase in the coefficient of the father's labor supply in rural areas in extended families. This

suggests that the increase in family size increases the economic pressure on the family, and the burden of parental family care is increased by the need to care for the elderly while raising children. Parents in urban areas meet the demand for family care by engaging in occupations with low OPS scores but relatively flexible working hours. Fathers in rural areas, as the main breadwinners of the family, increase their labor income by increasing their labor supply, to maintain the balance of income and expenditure of the family after the expansion of the family size.

Tables 8 and 9 represent two sets of robustness tests, one related to the definition of the number of children in the family and the other related to the measure of occupational prestige scores (OPS).

The previous calculation of the number of children was based on the samples' personal code of children. Now, we use the criterion of whether the children are alive to calculate the number of children in the family. The results in Table 8 aligning in direction and significance with the Table 4 2SLS results. Considering the division of children by age, the result is consistent with the direction and significance of the results analyzed in Table 5.

To account for diverse societal perspectives on job values, we employ the U.S. 1988 International Standard Classification of Occupations (ISCO) as a substitute for OPS. The results in Table 9 demonstrate consistent direction and significance with those in Table 4, showing a decrease in parental occupational prestige scores with an increasing number of children.

The results of the robustness tests in Tables 8 and 9 illustrate the robustness of the results of our analyses.

Table 8: Robustness checks of alternative definitions of child quantity (2SLS)

	Number of children surviving	
	Mother	Father
Labor Supply		
Children number	-.097*	-.017
	(.052)	(.031)
OPS		
Children number	-3.37**	-3.27**
	(1.39)	(1.35)
Families with the first born child <=7		
Labor Supply		
Children number	-.118*	-.043
	(.071)	(.036)
OPS		
Children number	-4.23**	-3.92***
	(2.01)	(1.21)
Families with the first born child >7		
Labor Supply		
Children number	-.058	-.002
	(.050)	(.032)
OPS		
Children number	-2.76*	-2.55
	(1.58)	(1.92)

Control variables	Y	Y
Province fixed effect	Y	Y
Year fixed effect	Y	Y

Note: Standard errors shown in parentheses are clustered by province-year level. * p<0.1 **p<0.05 ***p<0.01

Table 9: Robustness checks of occupational prestige of the 1988 US version

	OLS	
	Mother	Father
Children number	-2.55**	-1.91**
	(1.01)	(1.41)
2SLS		
Children number	-3.38**	-2.65**
	(1.47)	(0.74)
Control variables	Y	Y
Province fixed effect	Y	Y
Year fixed effect	Y	Y

Note: Standard errors shown in parentheses are clustered by province-year level. * p<0.1 **p<0.05 ***p<0.01

5. Conclusions

In summary, against the backdrop of the implementation of the "universal two-child" policy, the expansion of higher education, and the narrowing gender gap in labor market and family status, the inhibitory effect of children on parental labor market performance has shifted from labor supply to occupational prestige scores.

The younger the children, the higher the penalties on parental labor market performance. As the children grow older, the negative impact of children on parents' labor diminishes significantly. Urban parents experience more negative effects on labor market performance from their children compared to rural parents. In rural families, fathers bear more of the household economic pressure and actively increase their labor supply in response to an increase in the number of children.

Faced with extended families, urban parents opt for lower occupational prestige to take care of their family. Rural fathers have increased employment, thus alleviating the economic pressures stemming from an extended family. The urban-rural disparity, in particular extended families, further highlights the differences in parents' labor market performance in the face of family structure expansion across diverse occupational mobility, household roles and economic backgrounds.

Our results provide policy directions for the further development of the labor market and gender equality in family roles in China. First, the Chinese government should promote diversity in the development of occupations in the labor market. The government has to accelerate the development of the tertiary industry to increase the labor market's employment absorption

capacity. The government should encourage social organizations (such as trade unions) to play an active role in providing flexible and diverse forms of employment for workers. Secondly, the government should improve the birth policy and increase the infrastructure for child care. With regard to the labor market, the government should improve labor protection laws relating to maternity, to safeguard the labor rights and interests of mothers and prevent them from dropping out of the labor market due to childbirth. The employment sector should implement a system of paid maternity leave and provide mothers with corresponding financial subsidies, to provide them with financial assistance. At the same time, the government should call for a system of maternity leave for men, so that men can be more involved in childcare and women's burden of family care can be reduced. On the social front, the government needs to provide additional childcare infrastructure, such as kindergartens, to provide social support to parents in caring for their children.

The limitation of our study is that it only observes changes in parental occupational prestige scores as the number of children increases, and fails to look more specifically at parental occupational mobility. Our findings suggest new research directions for understanding the relationship between fertility and parental labor market performance in China in terms of parental occupational choice and family status. Our study of the relationship between fertility and parental labor supply is no longer limited to labor force participation, working hours, and income, but we also focus on parents' occupational choices. Moreover, the results of our analysis also revealed that the allocation of parental time to household chores also affects parental labor supply. In future analyses of the correlation between fertility and parental labor supply, the bargaining power within the parental household is also an important factor to consider.

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