

Gender equality and Fertility Preferences in China

Abstract

Gender inequality has been recognized as a classic explanation for the fertility decline and the continuous low fertility rate. However, the relationship between gender equality and fertility or fertility preference has still not been fully understood. Recent cross-country comparative research shows that there is no uniformed shape for gender equality and fertility preference, and that it varies across time and societies. China is a particularly interesting case to investigate the relationship between fertility preferences and gender equality, not only because its fertility rate has declined to a very low level, but also because it has very specific gender equality context with a strong expectation for women’s labour force participation, but also an unequal division of unpaid work resulting in a double burden for women. This paper applies a longitudinal design using 7 waves of China Health Nutrition Survey (CHNS) to explore the influence of gender equality on women’s fertility intentions in China. It compares three dimensions of gender equality: 1. the gender division of workload in paid work; 2. the gender division of workload in unpaid work; and 3. the distorted division of paid work and unpaid between couples. The results show that there is an equal gender distribution of paid work but an unequal division of unpaid work. The absolute workload burden from paid and unpaid work is found to have a significant effect on fertility intention. However, we find no evidence for the negative influence of unequal division of paid and unpaid work on the intention to have another child. This suggests that the gender inequality theory do not apply to the fertility preference in China, but it is rather the sheer workload in absolute terms that seems to matter

Table of Contents

1. Introduction	2
2. Gender equality and Fertility Preference: theory and practice	3
3. Fertility preference and gender equality in Asia and China	4
4. Data, Measurement and Method	5
4.1. Data	5
4.2 Measurement	5
4.3 Methods	7
5. Results	8
5.1 Descriptive results	8
5.2 GEE Model Results	11
6. Conclusion and Discussion	13
Bibliography	14
Attachment	16

1. Introduction

The gender inequality has been recognized as an important explanation for the low fertility in western societies (Goldscheider, Bernhardt, & Lappegård, 2015; Mcdonald, 2006; Neyer, Lappegård, & Vignoli, 2013) which lead to a variety of pronatalist policies which correlated to promote the gender equality (Davies, 2013; Heeren, 1982; Mcintosh, 1986; Neyer, Caporali, & Gassen, 2013). However, the relationship between gender equality and fertility/fertility preference has still not been fully understood. Recently cross-country comparative research shows that there is no uniformed shape for gender equality and fertility, it varies across time and societies(Kolk, 2018; Neyer, Lappegård, et al., 2013). Therefore, it is important to have a deep insight into gender equality based on the context in the specific societies to unveil its role on fertility, especially on fertility preference which have direct and unconscious influence on fertility decisions(Liefbroer, 2009; Morgan & Rackin, 2010).

The body of literature on gender equality and fertility, however, is mostly concerned with countries from either Europe or North-America (Mills, 2010). Asia, and particularly China, is seldom incorporated in comparative research, despite the fact that many countries in Asia also experience low or the lowest fertility, like South Korean(Anderson & Kohler, 2013). China is particularly interesting in this respect: since the 1990s, China's fertility has kept decreasing to the Total Fertility Rate (TFR) of 1.4-1.6 children per woman, well below replacement levels (Hou, 2015). Researchers have previously attributed China's low fertility to family planning restrictions. However, findings from recent surveys instead indicate that the intended total number of children is 1.93 or lower and more than 60% of young couples who come from one-child families do not want to have a second child (Feng, 2010).

These studies suggest that socioeconomic factors have a stronger effect on fertility than the policy constraints, because of the increasing cost of raising a child and perhaps the rapid industrialization in China has reshaped lifestyle and family preferences of the current generation (Hou, 2015; Merli & Morgan, 2011). Moreover, China's gender equality is a complex phenomenon; it stays in the top female labour participation level in Asia, and the government has strived towards creating a more gender-equal society resulting in a significant improvement in the status of women in both public and private domains in recent decades. However, there still exists gender discrimination on the labour market in terms of salary and promotion, including motherhood wage penalties. Similarly, traditional values in China are still mainstream in that women are supposed to be in charge of housework and care within households. In this case, China is a very suitable to be studied in the topic of gender equality and fertility preference.

This paper will firstly try to figure out what is the definition of gender equality in China, with a special focus on the economic and domestic work division. Secondly, it will investigate what is the relationship between the two dimension of gender equality and fertility preferences. The main purpose here is to find out an appropriate measurements to describe gender equality in China and exam that 1) whether there is universal gender inequality in china; 2) whether and how the unequal gender division decreases the fertility preference of married women by using a longitudinal design.

2. Gender equality and Fertility Preference: theory and practice

There is a lot of theories and empirical research on the gender equality and fertility, like McDonald's Gender equity theory (McDonald, 2000), which divided the gender equity into two types: the equity in "individual-oriented institutions" and in "family-oriented institutions" that explains how different societies have different levels of fertility. He assumed the transition of low fertility is due to the low equity within the family but individual equity like education and employment is rapidly increased. Goldscheider (2013) use the gender revolution theory to explain the second demographic transition and suggest that the home involvement of men chores will increase the fertility and strengthen the union. In 2015, Esping-Andersen and Billari re-theorized family demographics by arguing the reversal of fertility decline trend is due to the diffusion of gender-egalitarian norms (Esping-Andersen and Billari, 2015). The latter two theory enhance the role of gender equality to halt the fertility decline while McDonald's theory explained what might have happened in the past.

However, new cross-national research shows that there is no uniformed relationship between gender equality and fertility (Neyer, Lappegård, et al., 2013), the U shape relationship discovered by Torr (2004) is challenged by Kolk (2018) who find the U-shaped pattern is weak between societal gender equality and fertility across societies and time. And many findings in national level are also inconsistent and shows different patterns. For example, Cooke find that husband's involvement in domestic labour will increase the risk to have second child in Spain and Italy (Cooke, 2004 & 2009). However, Nilsson (2010) found there is no significant relationship between the division of housework and the likelihood to have children.

Fertility preferences particularly fertility intentions has a straightforward link to the fertility outcome ((Morgan & Rackin, 2010). Theory of planned behavior (TPB, (Ajzen, 1991)) and theory of conjunctural action (TCA, (Morgan & Bachrach, 2011)) show the framework how intention can be transfer into behaviors. Although there is quite a number of critiques on the fertility ideals, Sobotka (2014) used 168 surveys from 37 countries to find that there is a two-child family ideal norm in Europe which is surprisingly stable and persistent. Fertility preferences contains ideal, desires, intentions, which can be defined differently depends on the survey question and motivation of the answers. We can regard the fertility ideal as the highest level of potential fertility rate in a long term. Intention is more like a direct estimate on the recent fertility level. The fertility desires can be regarded as a measure between the plan and the ideal; however, it can be more similar to intention when asking parity progression desires. Through the three concepts, intention is now the most popular way to measure the fertility preference. And there is also a body of literature study the relationship between fertility intention and gender equality. For example, Mills (2008) examined whether the unequal division of domestic labour lower the women's intentions between Netherlands and Italy of which has different level of gender equity, while the finding shows that the unequal division of housework only play a role when there is a heavy workload. Miettinen (2015) found that the gender equality attitudes are related to the childbearing intentions but differently linked to women and men. Craig(2010) found there is no evidence between husband's participation in neither childcare or housework, not even mediated by the wife's share.

The theory and practice of gender equality and fertility/ fertility preference shows fruitful patterns of the relationship which indicate that this relationship varies from societies and time. Most of the literature is using the data based on western societies, therefore it lacks the insight of the eastern

world. Studying the eastern societies, especially China (which has the largest population), will contribute to the literature in this field. Meanwhile, it also shows that the evidence for gender equality and fertility preference is complicated and weakly supported. It is meaningful to study new societies to test the relationship between gender division of housework and fertility preference.

3. Fertility preference and gender equality in Asia and China

There are a small number of literature in fertility intentions of Asian societies in English. Kan & Hertog (2017) use the ideal number of children and the housework participation times (frequency of housework) and gendered housework share (respondents' housework frequency score minus spouses' score) to find out that husbands' participation in housework is positively associated with women's preferred number of children in all four countries. Women also lower their ideal number of children if their housework share increases, as women suffered more from the conflicts between the domestic work and the work in the labour market. These results are based on the pooled data but the result of China is not significant.

Kim (2017) use the husbands' time spent on domestic labour, whether having parents' support, the expenditure of the formal childcare and private education to predict the intended birth (the intended to have another child). The result shows that the husbands' support in the domestic labour increased the likelihood of intended births of his wife. Getting help from formal childcare also had a positive impact but only when its costs were not high but getting the help from parents did not have significant impact. Yang (2017) use the gendered division of domestic work to analyze the willingness to have another child in China. She found that the more time wife spent on housework and childcare, the less willingness the wife wants to have another child. But the result turns statistical insignificantly when adding the sex composition of the first child.

These research shows the inconsistent findings on the relationship between domestic work and fertility preference, which can be due to the difference of cultural and social values or just because of the heterogenous data and measurements. Meanwhile, the effect size is small or insignificant. Especially in China, the evidence to support the gender division and fertility preference is limited. It needs further work to better format the typology of gender equality and have a deeper understanding on the distortion of the gender equality. Compared to individual equality in the society e.g. women now can be more independent in the labour market and easily obtain higher education level, the household equality is very limited as the women are still supposed to share most of the housework at home. The housework and childcare normally did not share equally especially in Asia, as the traditional Confucianism has a very conservative attitudes towards women. This distortion of unequal gendered division of work can be a very rational reason to explain the low fertility and fertility decline in Asia. To better understanding the gender equality and fertility preference, this paper will test following hypothesis:

1. The heavier workload, the less willing to have another child
 - 1.1 The more workload of women has in housework, the less willing to have another child.
 - 1.2 The more workload of women has in work, the less willing have another child.
 - 1.3 If having heavy workload of both housework and the work in the labour market, the least willing to have another child.

2. The more unequal, the less willing to have another child
 - 2.1 The more unequal share of housework at home, the less willing to have another child.
 - 2.2 The more share of work with a more share of housework at the same time will lead to the least willing to have another child.
3. For dual workers, the more workload and more unequal, the less willing to have another child
 - 3.1 the more workload at work and unequal at housework, the less willing to have another child
 - 3.2 the more workload at housework and unequal at work, the less willing to have another child

4.Data, Measurement and Method

4.1. Data



A longitudinal dataset CHNS (China Nutrition and Health Survey) will be used to answer the research question. CHNS has a sample size of 7200 households with over 30,000 individuals that covers 15 provinces and municipal cities in China (see map in graph 1). It has 9 waves from 1989 to 2015, but 1989 and 2015 did not have the information on fertility preference. The latter two waves 2011 and 2015 have additional cities and provinces, so there are new respondents. Meanwhile, there is a lot of censorings and truncations (see the participating rate in table 1 attached). So we use the GEE models in the analysis to detect the repeated records that are from the same ID to maximize the sample size.

Graph 1. The map of participating provinces (CHNS, 2019)

4.2 Measurement

The predictor here is the desire/willing to have another child, which is code as 0 for not wanting another child, 1 for wanting another child. The key predictor here is the division of work at work and at housework which is paid and unpaid work (see the measurement of the key predictor in the table 2) which has three ways (see table 3):

Table 3 The typology of Gender equality between couples

Concept	Scale	label
1.1 workload of women at paid work	0	housewife
hours per week	0-20	less load
(same as husband workload)	20-50	normal load
	>50	heavy load
1.2 workload of women at unpaid work	0	no load
hour per week	0-2.5	less load
(same as husband workload)	>2.5	heavy load
1.3 interaction of workload of women at paid and unpaid work	interaction of 4*4 factors	
2.1.ratio of paid work	-1	House husband
	-2	Housewife
	-3	Non-working couple
	>1.25	husband work more
	0-0.75	wife work more
	<1.25 & >0.75	equal load
2.2ratio of unpaid work	-1	wife do all the housework
	-2	husband do all the housework
	-3	Non-housework couple
	>1.25	husband work more
	0-0.75	wife work more
	<1.25 & >0.75	equal load
3.1 interaction of unpaid workload and ratio of paid work	interaction	interaction between dual earner
3.2 interaction of paid workload and ratio of unpaid work	interaction	interaction between dual earner

Use the three dimensions of division of gender equality, we can compare the absolute paid and unpaid work, the ratio of paid and unpaid work and the interaction of the workload and the division of workload at home between couples.

The control variables are the number of kids, age, different waves (which are recoded into time from 0 to 9), residence (0 is living in rural area, 1 is urban area), highest education level obtained by wife and husband (0 is less than primary level, 1 is primary level, 2 is secondary level, 3 is tertiary level). After merge all the data and delete the missing variables, the sample size is 9174, which is distributed by wave in the table 4.

Table 4 sample size in the analyzed table

wave	1991	1993	2000	2004	2006	2009	2011	2015
n	2743	2639	3165	3151	3178	2534	3216	2935

4.3 Methods

GEE (Generalized Estimating Equations) are used as the regression model in the longitudinal design. It detects the same individuals in different waves and it does not require multivariate distribution of normality which is perfectly fit here because the outcome, desire to have another child is binary (0,1) so as other predictors which are not distributed in normality e.g. the biased gender division of labour. The formula of the model is to previous hypothesis, which are

1. The more workload of women at housework and work, the less willing to have another child.

Model 1 The workload at paid and unpaid work

$$\text{logit}(P(y=1)) = \beta_0 + \beta_1.\text{number of kids} + \beta_2.\text{time} + \beta_3.\text{age} + \beta_4.\text{residence} + \beta_5.\text{province} + \beta_6.\text{educaiton of wife} + \beta_7.\text{educaiton of husband} + \beta_8.\text{workhour of wife} + \beta_9.\text{houework hour of wife} + \beta_{10}.\text{workhour of husband} + \beta_{11}.\text{houework hour of husband} + \text{error term}$$

Model 2 The interaction of workload at paid and unpaid work for the wife

$$\text{logit}(P(y=1)) = \beta_0 + \beta_1.\text{number of kids} + \beta_2.\text{time} + \beta_3.\text{age} + \beta_4.\text{residence} + \beta_5.\text{province} + \beta_6.\text{educaiton of wife} + \beta_7.\text{educaiton of husband} + \beta_8.\text{workhour of wife} + \beta_9.\text{houework hour of wife} + \beta_{10}.\text{workhour of husband} + \beta_{11}.\text{houework hour of husband} + \beta_{12}.\text{workhour of wife} * \text{housework hour of wife} + \text{error term}$$

2. The more unequal, the less willing to have another child

Model 3 The division of paid and unpaid work

$$\text{logit}(P(y=1)) = \beta_0 + \beta_1.\text{number of kids} + \beta_2.\text{time} + \beta_3.\text{age} + \beta_4.\text{residence} + \beta_5.\text{province} + \beta_6.\text{educaiton of wife} + \beta_7.\text{educaiton of husband} + \beta_8.\text{workhour.ratio} + \beta_9.\text{housework.ratio} + \text{error term}$$

Model 4 The interaction of the division of paid and unpaid work

$$\text{logit}(P(y=1)) = \beta_0 + \beta_1.\text{number of kids} + \beta_2.\text{time} + \beta_3.\text{age} + \beta_4.\text{residence} + \beta_5.\text{province} + \beta_6.\text{educaiton of wife} + \beta_7.\text{educaiton of husband} + \beta_8.\text{workhour.ratio} + \beta_9.\text{housework.ratio} + \beta_{10}.\text{workhour.ratio} * \text{housework.ratio} + \text{error term}$$

3. For dual workers, the more workload and more unequal, the less willing to have another child

Model 5 The interaction of workload for the wife at paid work and the division for the paid work and the interaction of workload for the wife at unpaid work and the division for the unpaid work

$$\begin{aligned} \text{logit}(P(y=1)) = & \beta_0 + \beta_1.\text{number of kids} + \beta_2.\text{time} + \beta_3.\text{age} + \beta_4.\text{residence} + \beta_5.\text{province} + \\ & \beta_6.\text{educaiton of wife} + \beta_7.\text{educaiton of husband} + \\ & \beta_8.\text{workhour.ratio} + \beta_9.\text{housework.ratio} + \\ & \beta_{10}.\text{workhour.ratio} * \text{workhour of wife} + \\ & \beta_{11}.\text{housework.ratio} * \text{housework hour of wife} + \text{error term} \end{aligned}$$

Model 6 The interaction of workload for the wife at paid work and the division for the unpaid work and the interaction of workload for the wife at unpaid work and the division for the paid work

$$\begin{aligned} \text{logit}(P(y=1)) = & \beta_0 + \beta_1.\text{number of kids} + \beta_2.\text{time} + \beta_3.\text{age} + \beta_4.\text{residence} + \beta_5.\text{province} + \\ & \beta_6.\text{educaiton of wife} + \beta_7.\text{educaiton of husband} + \\ & \beta_8.\text{workhour.ratio} + \beta_9.\text{housework.ratio} + \\ & \beta_{10}.\text{housework.ratio} * \text{workhour of wife} + \\ & \beta_{11}.\text{workhour.ratio} * \text{housework hour of wife} + \text{error term} \end{aligned}$$

5. Results

5.1 Descriptive results

Table 5. The percentage of desires for another child by the number of kids

n.kids %	1991	1993	2000	2004	2006	2009	2011
0	58.54	44.74	44.44	58.73	53.85	53.92	41.72
1	21.38	15.74	8.19	15.76	16.14	16.20	14.51
2	14.76	10.85	8.96	6.47	6.28	5.12	4.86
3	7.64	7.57	8.26	5.20	5.28	4.72	4.89
4	4.76	3.03	0.00	1.19	3.33	0.00	2.63
5	10.87	0.00	0.00	3.45	0.00	0.00	0.00
6	8.70	5.56	0.00	12.50	0.00	0.00	0.00
7	16.67	20.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	100.00	50.00	0.00	0.00	0.00	0.00	0.00

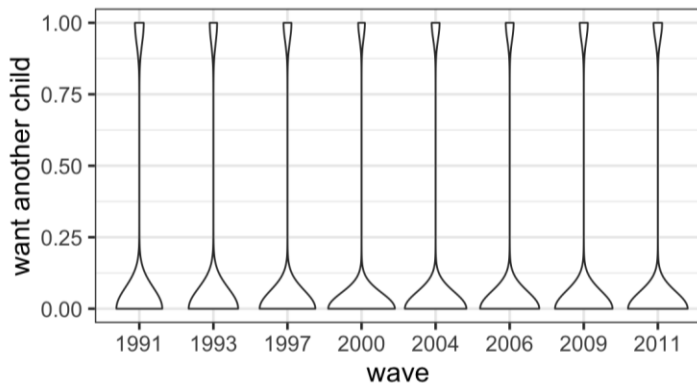
It can be seen from the Table 5 that the percentages of women who want to have another child is most distributed among married women who has not had a kid. With number of kids increasing, the desires for another kid kept decreasing.

Table 6 show the typology of the couple based on their working hours, it can be seen that more than half couple are full-time dual earners, the second large group is the wife works in part-time but their husband works full time,

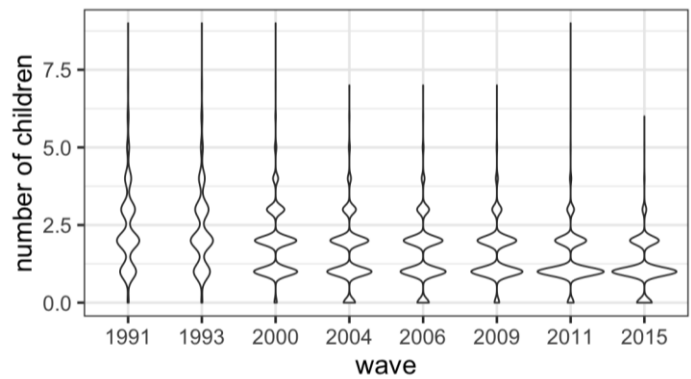
Table 6. The typology of couples based on work time

Type	1991	1993	2000	2004	2006	2009	2011	2015
full-time dual worker	1617	1218	1041	1090	1126	959	1316	1006
<i>prop</i>	0.780	0.678	0.584	0.553	0.570	0.556	0.602	0.502
house husband	78	133	78	97	112	107	129	186
<i>prop</i>	0.038	0.074	0.044	0.049	0.057	0.062	0.059	0.093
housewife	102	128	251	340	331	335	437	412
<i>prop</i>	0.049	0.071	0.141	0.173	0.168	0.194	0.200	0.206
part-time dual worker	79	120	150	92	94	65	46	70
<i>prop</i>	0.038	0.067	0.084	0.047	0.048	0.038	0.021	0.035
part-time husband	50	46	42	55	36	38	31	34
<i>prop</i>	0.024	0.026	0.024	0.028	0.018	0.022	0.014	0.017
part-time wife	125	121	111	147	112	95	90	99
<i>prop</i>	0.060	0.067	0.062	0.075	0.057	0.055	0.041	0.049
unemployed	21	30	111	149	163	125	137	196
<i>prop</i>	0.010	0.017	0.062	0.076	0.083	0.073	0.063	0.098
Total	2072	1796	1784	1970	1974	1724	2186	2003

Graph 2. the distribution of the desires for another kid

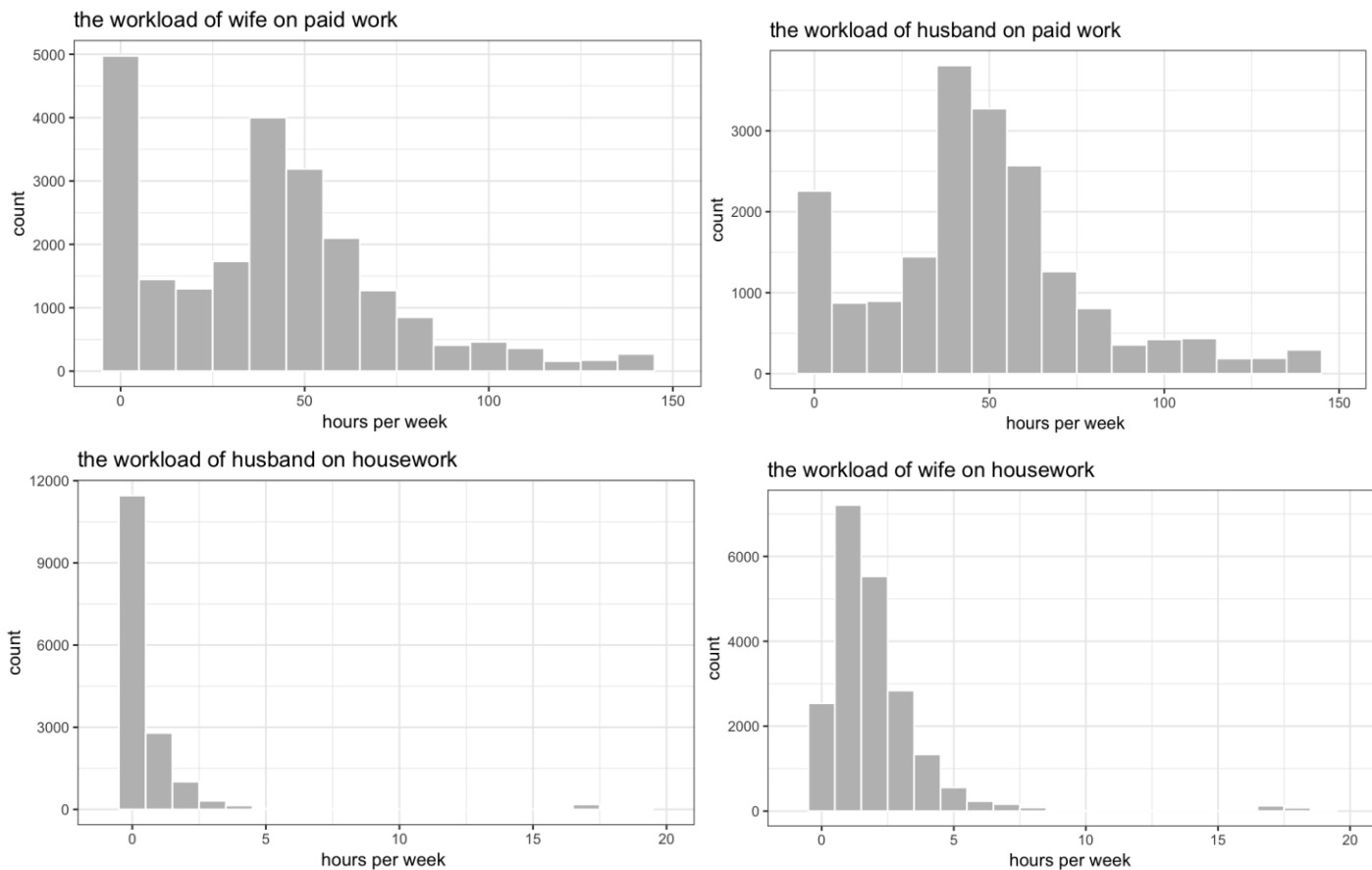


Graph 3. the distribution of the number of children



Graph 2 shows the percentages of kids wanted per wave, the violin graph show that the percentage is low, most value is close to 0 because it considers all the married women who might already have kids, the changes through wave is minimal. Graph 3 shows the number of children by wave, it shows that in the earlier waves, women has more number of kids, while in the new waves, the mean number of children declined.

Graph 4 The distribution of workload of paid and unpaid work by wife and husband



From the Graph 4 we can find that the number of housewife is much more than the number of husband who did not work, the number of non-working individual is high due to there exist retiring people in the data. The workload of husband is on average higher than the wife, while both of the gender has a heavy workload on average. From the housework hours distribution, we can find that there is a biased distribution in the left graph, and there is an obvious unequal share of housework in the household on average, wife spent more hours on housework than the husband.

5.2 GEE Model Results

There are six models in the table 7 below which is correspondent to the hypothesis. Only the variables which are statistically significantly are selected in the table here in order to give a better visualization (except the provinces as the focus in this work is not the space difference). From the table, we can see generally that, the number of kids, age and survey time always have an effect on the logit of desires to have another child. With the increased number of kids, the desire for another decrease rapidly (estimates are from -0.45 to -0.51) which explains a lot of variances in the model. With aging, the desire for another declined (estimates are -0.13 and -0.12), while when time passing, the desires for another child increased which might be due to the distribution of age or the new adding individuals from the recent waves. The urban residents have a lower preference to have another child when the model is not involved in many interactions, which is easily to be understood that the family policy applied differently in rural area and the traditional agriculture prefers a larger number of children. Husband with tertiary education level prefers to have another child compare to the men who have lower level education level, but the effect is disappeared in the dual-earner models, which indicates that dual earners perhaps have better education level.

It is also clear to response to the hypothesis from the models. For the first hypothesis: if there is a heavier workload, the less willing of the woman to have another child, which is not always the case. The hypothesis 1.1 got supported from the model 1 that compared to the women who have heavy load on housework, the women who has no housework load has higher desires to have another child. However, the hypothesis 1.2 get rejected by the model 2, conversely, the more workload of women have at work, the higher willingness they want to have another child. It might be because the more working hours the women spent, the higher income they have, therefore they can afford the desires for another child. For hypothesis 1.3, surprisingly, it got a converse evidence that: compared to the women who have both heavy workload at work and at home, the housewife who has no or less housework has the least desires to have another child, the logit is -1.65 and -0.75 which is very high in the model 2.

For the second hypothesis, we do not have the evidence to support the first sub-hypothesis 2.1 that the more unequal share of housework at home, the less willingness to have another child from model 3. But we find that: compared to the equal working couples, if the husband or the wife works more, they have higher desires to have another child. The hypothesis 2.2 got rejected by model 4, as the couple who shares equal paid work and equal unpaid workload has much lower desires to have another child compared to the women who did not work and their husband do all the housework. It makes sense that more involvement of husband, the higher desires the wife has to have another child.

For dual workers, there is no evidence to support the third hypotheses, only the increased hours of housework spent by the wife decrease her desires significantly according to the model 5 and 6.

Table 7 GEE models

	Model1		Model2		Model3	
	Estimate	Std.er	Estimate	Std.er	Estimate	Std.er
Number of kids	-0,45	0,09***	-0,46	0,09***	-0,47	0,09***
Age	-0,13	0,006***	-0,13	0,006***	-0,13	0,006***
Year of survey	0,06	0,02**	0,54	0,02*	0,58	0,02**
Residence	ref: rural					
Urban	-0,18	0,09.				
Education:						
Husband tertiary	0,39	0,23.	0,4	0,23.	0,40	0,23.
Wife's unpaid workload (by hours)	-0,04	0,37**				
Wife's paid work load:	ref: heavy load					
No load (housewife)			0,32	0,20.		
Less load			0,50	0,26.		
Wife's unpaid load:	ref: heavy load					
Interaction of wife's paid and unpaid workload	ref: heavy workload at both		0,60	0,32.		
Housewife*less unpaid workload			-0,75	0,25**		
Housewife*less unpaid workload			-1,65	0,47***		
Division in paid work	Ref: work equally					
Husband works more					0,17	0,10.
Wife works more					0,31	0,12**
N	5188		5188		5188	

Continued Table 7

	Model4		Model 5		Model 6	
	Estimate	Std.er	Estimate	Std.er	Estimate	Std.er
Number of kids	-0,47	0,09***	-0,51	0,11**	-0,51	0,1**
Age	-0,13	0,01***	-0,12	0,01**	-0,12	0,01**
Year of survey	0,06	0,02**	0,04	0,02.	0,04	0,02.
Residence	Ref: rural					
Urban					-0,27	0,11*
Education:						
Husband tertiary	0,40	0,23.				
Wife's unpaid workload (by hours)			-0,05	0,02*	-0,07	0,02***
N	5188		4278		4278	

Note: .p < .1, *p < .05, **p < .01, ***p < .001.

6. Conclusion and Discussion

From the results we can see a clear picture of the relationship between the number of children and the desire for another child, around half women who has never had a child want to have another child, the less women desires another if they already had a child. There is a quite equal distribution on the workload between couples in the labour market, but the average working load is quite heavy, more than 40 hours a week and most couples are dual earners in the survey. The housework division is unequal in the household, most women do much more housework than their husbands.

By comparing three measurements of gender equality, the absolute working hours at work or at home play a more significant role on the fertility desires. Women who have no load of housework and the women have more workload in the labor market more likely to prefers to have another child. The equal division of labour at home and at work are both rejected, only the hours spend on housework significantly influence the women's desires to have another child, it seems the gender equity theory at least did not apply in China. We can assume that there is a probability that the gender equality theory or revolution theory did not apply perfectly on the micro-individual level fertility intention or desires. Another assumption thereby can be that the equal division theory did not apply to the rapid economic developing societies like China, where the biggest anxiety to have another child now among young couple is the economic capacity to raise a child. As the cost of childrearing increase crazily in large cities and the time to have the first child is also prolonged (Song,2016).The other factors like the income can take the effect from the gender equality on the fertility desire, that the main concern for current Chinese couple is not the equality but the affordability to have another child. For women, the motherhood penalty become universal, and they need to make sacrifice in the labor market to have another child (Yang, 2017). This is also another format of the gender equality that influence the fertility and fertility desires.

Besides the adaptability theory, the data itself also have defects, like the variance of the desire to have another child for the people who already have a child is very limited, and there is a lot censoring and truncation that influence the sample size. But still, this dataset can be worked further to have a deeper analysis on this topic. For example, the realization of the desires is very interesting to test using the new waves. The hours spent on childcare, income and outsourcing for housework and childcare can be very important predictors to the fertility desires and fertility. This paper is still an ongoing work that all the elements mentioned above will be taken into consideration in the next-step analysis.

Bibliography

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211.
- Anderson, T., & Kohler, H.-P. (2013). EDUCATION FEVER AND THE EAST ASIAN FERTILITY PUZZLE. *Asian Population Studies*, 9(2), 196–215. <https://doi.org/10.1080/17441730.2013.797293>
- CHNS. (2019). China Health and Nutrition Survey. Retrieved from China Health and Nutrition Survey: <https://www.cpc.unc.edu/projects/china>
- Craig, L. and Siminski, P. (2010a). If men do more housework, do their wives have more babies? *Social Indicators Research* 101(2): 255–258. doi:10.1007/s11205-010-9644-1.
- Cooke, L.P. (2004). The gendered division of labor and family outcomes in Germany. *Journal of Marriage and Family* 66(5): 1246–1259. doi:10.1111/j.0022-2445.2004.00090.x.
- Cooke, L.P. (2009). Gender equity and fertility in Italy and Spain. *Journal of Social Policy* 38(1): 123–140. doi:10.1017/S0047279408002584.
- Davies, R. (2013). *Promoting fertility in the EU: social policy options for Member States*. Retrieved from [https://eige.europa.eu/docs/2047_LDM_BRI\(2013\)130519_REV2_EN.pdf](https://eige.europa.eu/docs/2047_LDM_BRI(2013)130519_REV2_EN.pdf)
- Goldscheider, F., Bernhardt, E., & Lappegård, T. (2015). The Gender Revolution: A Framework for Understanding Changing Family and Demographic Behavior. *Population and Development Review*, 41(2), 207–239. <https://doi.org/10.1111/j.1728-4457.2015.00045.x>
- Heeren, H. J. (1982). Pronatalist population policies in some Western European countries. *Population Research and Policy Review*, 1(2), 137–152. <https://doi.org/10.1007/BF00138440>
- Hou, Jianwei. (2015). Changes in the Chinese population's fertility intentions: 1980-2011. *Social Sciences in China*, 36(1), 46-63.
- Kolk, M. (2018). Weak support for a U-shaped pattern between societal gender equality and fertility when comparing societies across time. <https://doi.org/10.17045/STHLMUNI.6281351.V1>
- Liefbroer, A. C. (2009). Changes in Family Size Intentions Across Young Adulthood: A Life-Course Perspective. *European Journal of Population = Revue Européenne de Démographie*, 25(4), 363–386. <https://doi.org/10.1007/s10680-008-9173-7>
- Mcdonald, P. (2006). Low fertility and the state: The efficacy of policy. *Population and Development Review*, 32(3), 485–510. <https://doi.org/10.1111/j.1728-4457.2006.00134.x>

- McDonald, P. (2000). Gender equality, social institutions and the future of fertility. *Journal of Population Research*, 17, 1–16.
- McDonald, P. (2000). Gender equity in theories of fertility transition. *Population and Development Review*, 26(3), 427–439.
- McIntosh, C. A. (1986). *Recent Pronatalist Policies in Western Europe*. *Development Review* (Vol. 12). Retrieved from <https://pdfs.semanticscholar.org/c7da/bb6af7acflc5b71c50b108b57ddc5c06bde9.pdf>
- Mills, M. (2010). Gender Roles, Gender (In)equality and Fertility: An Empirical Test of Five Gender Equity Indices. *Canadian Studies in Population*, 37(3–4), 445. <https://doi.org/10.25336/p6131q>
- Miettinen, A., Basten, S., & Rotkirch, A. (2011). Gender equality and fertility intentions revisited: Evidence from Finland. *Demographic research*, 24(20), 469-496.
- Morgan, S. P., & Bachrach, C. A. (2011). Is the theory of planned behaviour an appropriate model for human fertility? *Vienna Yearbook of Population Research*, 9(1), 11–18.
- Morgan, S. P., & Rackin, H. (2010). The Correspondence Between Fertility Intentions and Behavior in the United States. *Population and Development Review*, 36(1), 91–118. <https://doi.org/10.1111/j.1728-4457.2010.00319.x>
- Neyer, G., Caporali, A., & Gassen, N. S. (2013). *EU-Policies and Fertility: The Emergence of Fertility Related Family Policies at the Supra-National Level*. IUSSP. Retrieved from <http://www.familiesandsocieties.eu/wp-content/uploads/2017/06/WP79NeyerCaporaliGasse2017.pdf>
- Neyer, G., Lappegård, T., & Vignoli, D. (2013). Gender Equality and Fertility: Which Equality Matters? *European Journal of Population / Revue Européenne de Démographie*, 29(3), 245–272. <https://doi.org/10.1007/s10680-013-9292-7>
- Nilsson, K. (2010). Housework and family formation: Exploring the relationship between gender division of housework and having children. *The Open Demography Journal* 6(3): 1–10. [doi:10.2174/1874918601003010001](https://doi.org/10.2174/1874918601003010001).
- Song Jian. (2016). The environment and the purpose of two-child policy in China. *Population & Economics*, 4, 121-126
- Yang, J. (2017). Gendered division of domestic work and willingness to have more children in China. *Demographic Research*, 37, 1949-1974.

Attachment

waves	1	2	3	4	5	6	7	8	9
n	3080	2083	1036	919	587	697	384	243	93

Note: as the number of participants who participated in all the waves are very limited, so we use the GEE models in the analysis to catch the repeated record that is from the same ID to maximize the sample size.

Key predictors	context	Measurement
Hours of paid work of wife	hours per week	Working hours of all types of work of the wife, including farming, fishing, etc
Hours of unpaid work of wife	hours per week	Working hours of housework of the wife
Hours of paid work of husband	hours per week	Working hours of all types of work of the husband, including farming, fishing, etc.
Hours of unpaid work of husband	hours per week	Working hours of housework of the husband
Division of paid work	Ratio of paid work	$\frac{\text{Hours of paid work of husband}}{\text{Hours of paid work of wife}}$
	-1	House husband
	-2	Housewife
	-3	Non-working couple
Division of unpaid work	Ratio of unpaid work	$\text{work} = \frac{\text{Hours of paid work of husband}}{\text{Hours of paid work of wife}}$
	-1	wife do all the housework
	-2	wife do all the housework
	-3	Non-housework couple