

The Impact of Neighborhood Environment on Women's Willingness to Have a Second Child in China

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Abstract

In recent years, the Chinese government has changed the one-child policy that was implemented more than 3 decades ago and has began encouraging couples to have 2 children. However, this cannot quickly change people's reproductive concepts after more than 30 years of low fertility rate and birth control. In this context, the aim of our study was to assess the effect of neighborhood environment on Chinese women's fertility-willingness for a second child. Our results show that there is a statistically significant relationship between neighborhood environment and women's fertility-willingness for a second child. Women living in affluent neighborhoods with better living environments have lower fertility-willingness for a second child than those in poor neighborhoods. However, childcare institutions (such as kindergartens) provide shared childcare and improve women's fertility-willingness. We suggest that to encourage more couples to have a second child, it is necessary to increase the number of neighborhood kindergartens. In addition, local governments must improve the social welfare of migrant households and loosen the requirements for migrant households to obtain local hukou, which will allow migrant children to enjoy local public services, especially education services.

Keywords

neighborhood environment, fertility, Chinese women, post-birth-control period, China

Introduction

The Chinese government implemented the one-child policy in the 1970s. This fertility transition was highly compressed in time, which led to potential long-term social and economic consequences.¹ In recent years, the Chinese government has become aware of the problems associated with a low population growth rate and has begun to implement a two-child policy. However, after more than 30 years of low fertility, people's fertility concepts and fertility behavior have undergone great changes.^{2,3} Especially with the rapid development of China's economy and the rapid improvement in the level of urbanization, increasing fertility will become progressively more difficult as it is in developed countries.^{4,5} Some investigators propose that social and economic factors are becoming more important than policy factors for fertility in China.^{6,7} For example, women with a higher level of education have fewer children than women with lower levels of education.⁸ If the fertility policy allows residents to have a second child, will the fertility-willingness of Chinese women rapidly increase? What factors affect women's reproductive choices? This study attempts to answer these questions and focuses on the effect of the neighborhood environment on Chinese women's fertility-willingness in the new social context.

In both Western and non-Western countries, it has been widely confirmed that urban fertility is lower than rural fertility.⁹ Compared with developed countries, in developing countries, rural fertility exceeds urban fertility at an even greater rate.¹⁰ There are also significant differences in the concept of fertility between urban residences and rural residences. For example, Olusanya¹¹ found that in Western Nigeria, the attitudes of rural women are far more favorable to high fertility than the attitudes of urban women. Many scholars believe that urbanization makes an important contribution to fertility reduction.^{12,13} Women in urban areas have higher education and fewer children, and their family size is smaller than that in rural areas. Therefore, we propose the first hypothesis:

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Hypothesis 1: Women living in rural areas are more likely to desire a second child than women living in urban areas.

Childcare facilities may influence women's fertility-willingness regarding a second child. Some studies have shown that increased availability of childcare increases fertility in developed countries.^{14,15} A study by Del Boca¹⁶ showed that the availability of childcare and part-time work increases the probability of working and of having a child. Childcare problems constrain women's employment,¹⁷ which may lead to a reduction in fertility-willingness for a second child. Presser and Baldwin¹⁸ found that childcare constraints were more prevalent among mothers who were young, Black, single, with low education, and with little income. However, there are also doubts about the impact of childcare facilities on fertility. For example, Kravdal¹⁹ suggested that improvements in the supply of private and public day care had a small stimulating effect on fertility in Norway. In China, there are wide variations in public service facilities between regions.²⁰ Therefore, we propose the second hypothesis:

Hypothesis 2: Women living in neighborhoods with sufficient childcare facilities are more likely to be willing to have a second child.

The effect of neighborhood environment on fertility is obvious among migrants and ethnic minorities. Previous studies have shown that rural-urban migrants have a lower fertility rate than do rural stayers.²¹ The fertility rate of migrants and the fertility rate of local residents gradually converge.²² A process of fertility adaptation and behavioral adaptation may exist.²³ Kahn²⁴ found that with the declining impact of the original cultural setting, migrants' fertility behavior becomes similar to that of the destination society. Neighborhood context matters for residents' fertility behavior.²⁵ Both neighborhood characteristics (such as poverty and crime) and the fertility norms of the neighborhood influence women's pregnancy and childbearing.^{26,27} Therefore, we propose the third hypothesis:

Hypothesis 3: Women's desire to have a second child is influenced by the general fertility trend of their neighborhoods.

There is an extensive body of literature on the relation between social status and women's fertility.^{28,29} Improving the social status of women leads to a reduction in fertility.³⁰ Women's education, income, and employment are the main indicators in the study of women's fertility.^{31,32} It is notable that women with a low level of education have more children.⁸ Especially in developing countries, increasing women's level of education will significantly reduce fertility.³³ Compared with urban women, the social status of rural women is relatively low, which is one of the main reasons

for the differences between urban and rural fertility.³⁴ Dodoo and Tempenis³⁵ argue that the gender inequality in rural areas influences reproductive decisions. Abadian³⁶ found that enhancing women's ability to achieve well-being will also lead to a reduction in fertility. In this study, women's socioeconomic characteristics will be used as the control variables in the analysis.

Based on the above literature review, we do not yet know whether neighborhood characteristics have a negative or positive impact on women's reproductive willingness in China. Therefore, to answer this question, this study will focus on the above 3 hypotheses and explore the relationship between neighborhood characteristics and the willingness of Chinese women to have one more child, and women's individual socioeconomic characteristics will be used as control variables. For the neighborhood characteristic variables, the type of neighborhood, the environmental assessment of the neighborhood, the average number of children per household in the neighborhood, and the average number of kindergartens in the neighborhood will be used as independent variables, and women's fertility-willingness will be used as the dependent variable. The rest of this article is organized as follows. Section "Methods" presents the data and method used in this study. The summary statistics of the sampling are also introduced in section "Methods." Section "Results" presents the results of a descriptive analysis and multilevel models on the number of children and women's fertility-willingness. Section "Discussion" presents the discussion, and section "Conclusions" presents the conclusion.

Methods

Data

The data used for this research were from the 2014 China Labor-force Dynamics Survey (CLDS) conducted by the Center for Social Science Survey at Sun Yat-sen University, China. These data are from a nationwide survey sample. The CLDS aims to systematically monitor the social structure and changes in a neighborhood to establish a tracking database on 3 levels: individual, family, and neighborhood. In this study, we used only the fertility data of women who already had one child for the analysis. The participants were women of childbearing age ($20 \leq \text{age} \leq 40$). After excluding missing data, there were a total of 567 participants (female participants, $20 \leq \text{age} \leq 40$) in our regression analysis.

Multilevel Logistics Model

The data used in this are multilevel data with a hierarchical structure. These data were collected on a neighborhood basis. Therefore, the multilevel logistics model is appropriate. In the regression model (see Table 3), the dependent variable relates to whether a woman who already has a child is willing to give birth to a second child (the question

is, “Will you have one more child when the government implements the two-child policy?”). Independent variables include urban neighborhood (ref.: rural neighborhood), the average number of kindergartens in the neighborhood (continuous variable), the environmental assessment of the neighborhood (continuous variable), and the average number of children per household in the neighborhood (ref.: ≤ 1). In the CLDS 2014, respondents were asked to evaluate the possibility of being exposed to environmental pollution based on where they will live in the future; they responded on a 4-point scale ranging from 1 to 4 (1 = “the possibility is very high” and 4 = “the possibility is very low”). The average number of children per household in the neighborhood is the mean value measured by all samples of the CLDS 2014. Control variables include age (continuous variable), marital status (ref.: single), educational attainment (schooling years, continuous variable), employment status (ref.: unemployed), hukou (ref.: locals with nonagricultural hukou), logarithm of annual personal income (continuous variable), self-evaluation of physical health (continuous variable), self-rated happiness in family life (continuous variable), the number of brothers and sisters (continuous variable), and region where the respondents live (ref.: the eastern region of China). The following question was used to measure the respondents’ happiness in family life: “In general, do you think your life is happy?” (from 1 = “very unhappy” to 5 = “very happy”).

The multilevel logistics model is specified as follows:

$$\log\left(\frac{P_{ij}}{1-P_{ij}}\right) = \beta_0 - X_{ij} + \beta Z_j + \mu$$

Here, P_{ij} is the possibility of the willingness to have a second child of respondent i in neighborhood j ; X_{ij} denotes a set of individual controls concerning socioeconomic and demographic characteristics; Z_j represents variables related to respondents’ neighborhood environment; and μ represents the random error. We used STATA 13.1 to perform the data analysis.

Results

Descriptive Statistics

Table 1 shows the socioeconomic status of the women and the neighborhood characteristics in this study. In terms of fertility-willingness, 35.45% of the women intend to birth a second child, whereas 64.55% of the women do not intend to birth a second child. In terms of demographic and socioeconomic characteristics, the average age of the sampled women is 32.72 (SD = 4.91) years. Most of the respondents are married (96.65%). The overall educational attainment is relatively low, with the proportion of high school and below accounting for 62.08% of the sample. The proportion of respondents employed is 91.36%. The proportion of local respondents with nonagricultural hukou, local respondents

Table 1. Summary Statistics of Women’s Characteristics in This Study (N = 567).

Variables	Mean/proportion
The fertility-willingness of women, %	
Will not have one more child	64.55
Will have one more child	35.45
Individual-level variables	
Age (20-40), y	32.72 (SD = 4.91)
Marital status, %	
Single	0.88
Married	96.65
Divorced and others	2.47
Educational attainment, %	
Primary school and below	8.11
Junior high school	31.22
Senior high school	22.75
College and above	37.92
Annual average personal income, yuan	43257.12 (SD = 134768.40)
Employment status, %	
Employed	91.36
Unemployed	8.64
Hukou, %	
Locals with nonagricultural hukou	49.21
Locals with agricultural hukou	35.27
Migrants with nonagricultural hukou	5.47
Migrants with agricultural hukou	10.05
Self-evaluation of physical health (1-5)	3.96 (SD = 0.80)
Self-rated happiness in family life (1-5)	3.89 (SD = 0.86)
Number of brothers and sisters, %	
≤ 1	44.97
2	27.51
≥ 3	27.52
Neighborhood-level variables	
Type of neighborhood, %	
Rural neighborhood	32.63
Urban neighborhood	67.37
Environmental assessment of the neighborhood (1-4)	3.11 (SD = 1.05)
Average number of children per household in neighborhood, %	
≤ 1	97.35
≥ 2	2.65
Number of kindergartens in the neighborhood, %	
≤ 2	75.49
> 2	24.51
Region-level variables	
Region, %	
The eastern region of China	46.91
The central region of China	17.11
The northeast region of China	10.93
The western region of China	25.04

with agricultural hukou, migrant respondents with nonagricultural hukou, and migrant respondents with agricultural hukou is 49.21%, 35.27%, 5.47%, and 10.05%, respectively.

Table 2. Women's Willingness to Have a Second Child (N = 567).

Variables	Will not have one more child		Will have one more child		Test statistics/ χ^2	P value
	Mean/proportion	SD	Mean/proportion	SD		
Individual-level variables						
Age (20-40), y	33.87	4.64	30.63	4.69	7.909	.000
Marital status, %					4.081	.130
Single	0.55		1.49			
Married	96.17		97.51			
Divorced and others	3.28		1.00			
Educational attainment, %					0.707	.871
Primary school and below	8.47		7.46			
Junior high school	31.15		31.34			
Senior high school	23.50		21.39			
College and above	36.89		39.80			
Annual personal income, yuan	48688.77	166408.70	33366.64	26645.45	1.296	.196
Employment status, %					9.052	.003
Employed	93.99		86.57			
Unemployed	6.01		13.43			
Hukou, %					9.250	.026
Locals with nonagricultural hukou	51.91		44.28			
Locals with agricultural hukou	33.61		38.31			
Migrants with nonagricultural hukou	6.56		3.48			
Migrants with agricultural hukou	7.92		13.93			
Self-evaluation of physical health (1-5)	3.96	0.79	3.95	0.83	0.163	.870
Self-rated happiness in family life (1-5)	3.83	0.87	4.01	0.84	-2.382	.018
Number of brothers and sisters	1.70	1.37	2.08	1.36	-3.193	.002
Neighborhood-level variables						
Type of neighborhood, %					14.617	.000
Rural neighborhood	27.05		42.79			
Urban neighborhood	72.95		57.21			
Environmental assessment of the neighborhood (1-4)	3.15	1.04	3.04	1.08	1.197	.232
Average number of children per household in the neighborhood	0.02	0.13	0.05	0.21	-2.018	.044
Average number of kindergartens in the neighborhood	1.94	1.65	2.34	2.39	-2.317	.021
Region-level variables						
Region					14.045	.003
The eastern region of China	43.44		53.23			
The central region of China	18.31		14.93			
The northeast region of China	14.21		4.98			
The western region of China	24.04		26.87			

The overall self-rated physical health score is 3.96 (1 indicates "very bad health" and 5 indicates "very healthy"). The respondents' average score for self-rated happiness in family life is 3.89 (1 indicates "very unhappy" and 5 indicates "very happy"). Most of the respondents have fewer than 3 brothers and sisters (72.48%). In terms of neighborhood characteristics, the proportion of respondents living in rural neighborhoods is 32.63%, and the proportion of respondents living in urban neighborhoods is 67.37%. In terms of neighborhood environment assessment, the average score is 3.11 (1 indicates "very serious pollution" and 4 indicates "no pollution"). The average number of children per household in the

neighborhood is less than 2, and the proportion of respondents living in a neighborhood with fewer than 3 kindergartens is 75.49%. In addition, the proportion of respondents living in the eastern region, the central region, the northeast region, and the western region is 46.91%, 17.11%, 10.93%, and 25.04%, respectively.

Table 2 summarizes the results of cross-tabulations of the fertility-willingness for a second child among women who already have one child. At the individual level, there are significant differences in age, employment status, hukou status, self-rated happiness in family life, and the number of brothers and sisters between women who are not willing to have a

Table 3. Multilevel Logistic Regressions on Chinese Women's Willingness to Have a Second Child (1 = Will Have One More Child, 0 = Will Not Have One More Child, N = 567).

	OR	95% CI
Independent variables		
Urban neighborhood (ref.: rural neighborhood)	0.362***	[0.188-0.698]
The number of kindergartens in the neighborhood	1.173**	[1.036-1.328]
Environmental assessment of the neighborhood	0.819*	[0.656-1.022]
Average number of children per household in the neighborhood (ref.: ≤1)	2.062	[0.530-8.028]
Control variables		
Age	0.855***	[0.814-0.898]
Marital status (ref.: single)		
Married	0.471	[0.064-3.481]
Divorced and others	0.194	[0.014-2.753]
Educational attainment (years of schooling)	1.113**	[1.024-1.209]
Hukou (ref.: Locals with nonagricultural hukou)		
Locals with agricultural hukou	0.623	[0.332-1.169]
Migrants with nonagricultural hukou	0.345**	[0.119-0.997]
Migrants with agricultural hukou	0.886	[0.404-1.941]
Logarithm of annual average personal income	0.965	[0.733-1.270]
Employment status (ref.: unemployed)	0.566	[0.269-1.192]
Self-evaluation of physical health	0.896	[0.674-1.191]
Self-rated happiness in family life	1.588***	[1.214-2.079]
Number of brothers and sisters	1.391***	[1.183-1.636]
Region (ref.: the eastern region of China)		
The central region of China	0.520**	[0.275, 0.983]
The northeast region of China	0.302***	[0.128, 0.712]
The western region of China	1.160	[0.662, 2.031]
N		567
Log likelihood		-300.389
χ^2		86.729***

Note. Exponentiated coefficients; 95% CI in brackets. OR = odds ratio; CI = confidence interval.

* $P < .10$. ** $P < .05$. *** $P < .01$.

second child and those who are. The mean value of the age of women willing to have one more child is significantly lower than that of women who will not have one more child (30.63 vs 33.87). Interestingly, the proportion of women who will have one more child and have a job is smaller than that of their counterparts (86.57% vs 93.99%). This finding indicates that work may have a negative impact on women's fertility-willingness. The proportion of local women and migrant women with nonagricultural hukou who will have one more child is smaller than that of their counterparts, and the proportion of local women and migrant women with agricultural hukou who will have one more child is larger than that of their counterparts. The self-rated happiness in family life of women who will have one more child is higher than that of women who will not have one more child (4.01 vs 3.83). The number of brothers and sisters of women who will have one more child is also higher than that of their counterparts (2.08 vs 1.70).

In terms of the neighborhood level, there are significant differences in the type of neighborhood, the average number of children per household in the neighborhood, and the

average number of kindergartens in the neighborhood between women who are not willing to have a second child and those who are. In rural neighborhoods, the proportion of women willing to have one more child is much larger than that of women not willing to have one more child (42.79% vs 27.05%). However, the proportion of women willing to have one more child and living in an urban neighborhood is much smaller than that of their counterparts (57.21% vs 72.95%). The average number of children per household and kindergartens in the neighborhood of women willing to have one more child is greater than that of their counterparts (0.05 vs 0.02 and 2.34 vs 1.94, respectively). In terms of the region level, the proportion of women willing to have one more child and living in the eastern region of China is much larger than that of women living in other regions of China.

The Model of Women's Fertility-Willingness

Factors such as neighborhood type, the number of kindergartens in the neighborhood, and the environmental assessment of the neighborhood have a significant impact on

Chinese women's fertility-willingness (see Table 3). Socioeconomic and demographic factors such as age, educational attainment, hukou status, self-rated happiness in family life, and the number of brothers and sisters also have statistically significant effects. That is, women living in rural neighborhoods are 2.762 times more likely to desire a second child than those living in urban neighborhoods. The number of neighborhood kindergartens has a positive relationship with women's fertility-willingness (odds ratio [OR] = 1.173, $P < .05$), whereas the respondents living in a neighborhood with a higher environmental assessment are less likely to have one more child than those living in a neighborhood with a lower environmental assessment (OR = 0.819, $P < .10$). In terms of socioeconomic and demographic factors, the older the respondents are, the less likely they are to have one more child (OR = 0.855, $P < .01$). Educational attainment (years of schooling) has a positive relationship with women's fertility-willingness (OR = 1.113, $P < .05$). Compared with local women with nonagricultural hukou, migrant women with nonagricultural hukou are less likely to have one more child (OR = 0.345, $P < .05$). In addition, respondents with higher self-rated happiness in family life (OR = 1.588, $P < 0.01$) and more brothers and sisters (OR = 1.391, $P < .01$) are more likely to have a second child. In addition, the respondents living in the central and northeast regions of China are less likely to have one more child than those living in the eastern region of China (OR = 0.520, $P < .05$; OR = 0.302, $P < .01$).

Discussion

This study shows that there is a relationship between the neighborhood environment and women's fertility-willingness for a second child. In terms of neighborhood type, women's fertility-willingness in rural neighborhoods is higher than that of women in urban neighborhoods, which validates hypothesis 1. This finding is related to the disparity in economic development between urban areas and rural areas in China. Rural areas mainly rely on traditional agriculture and manual labor. For many rural families, giving birth to a child means one more person in the labor force. Moreover, the social security system in rural areas is far less effective than that in urban areas; many rural families still believe in the concept of "raising children for the old" ("Yang Er Fang Lao").^{37,38} The cost of raising children is also much higher in urban areas. For many low- and middle-income families, fewer children means a smaller burden, which also leads to the low fertility-willingness of urban women.

Public service facilities in neighborhoods have a significant impact on women's fertility-willingness. This study reveals that there is a positive relation between the number of kindergartens in the neighborhood and women's fertility-willingness, which validates hypothesis 2. In China, kindergartens play an important role in caring for children aged 2 to 6. There are many types of kindergartens, including day-care

kindergartens as well as full-time-care kindergartens (parents take their children home on weekends and send them to kindergarten on Monday). For busy parents, kindergartens share in the care of children and increase their fertility-willingness. The neighborhood physical environment is mainly related to the socioeconomic status of women. Women who live in affluent neighborhoods have a better living environment than those in poor neighborhoods. Furthermore, many women who live in deprived neighborhoods are rural migrants whose fertility-willingness is higher than that of urban local residents. We also find that the general fertility trend of neighborhoods has no significant effect on women's fertility-willingness, which does not validate hypothesis 3. In addition, hukou (registered permanent residence) status also has a significant impact on women's fertility. Compared with local women with nonagricultural hukou, migrant women with nonagricultural hukou are less likely to have one more child. In China, especially in big cities, it is difficult for internal migrants to obtain local hukou.^{39,40} Most migrants can only get hukou through the purchase of housing, but China's housing prices are too high for low- and middle-income migrants.⁴¹ As a result, many migrants cannot get a local hukou. If the parents do not have a local hukou, their child also cannot get a local hukou, even if he is born locally. A child without local hukou has less access to public services (eg, public school) and has no right to obtain local social welfare.

This article indicates an effect of neighborhood environment on fertility. In the context of the transition from the one-child policy to the two-child policy, this study contributes to understanding changes in fertility in China. To improve the second childbearing willingness of Chinese women, we propose that the number of children's public service facilities, such as kindergartens, be increased in neighborhood planning and construction. In addition, local governments must improve the social welfare of migrant households and make it easier for migrant households to obtain local hukou so that migrant children can enjoy local public services,^{42,43} especially education services. Finally, this study has several research limitations. First, the economic status of a household may have an important effect on the willingness of Chinese women to have a second child. For data limitation, we used the variable of personal annual income instead of the variable of household income. Second, although the neighborhood has a significant effect on women's second childbearing willingness, women's childbearing is a decision-making process that is influenced by many factors,⁴⁴ such as personal health, family, neighborhood, cultural and economic factors, and policy. Third, although this study does not analyze the direct impact of policy factors on the second childbearing willingness of Chinese women, we agree that pronatalist policies have a positive effect on the willingness of Chinese women to have a second child.⁴⁵ Since 2013, the Chinese government has introduced additional fertility policies, such as the "Dan Du Er Hai" (if one

of the partners is the only child in his or her household, the couple can have 2 children) policy and the comprehensive two-child policy. However, despite its shortcomings, this study validates the impact of neighborhoods on women's fertility-willingness, which has not been addressed in the previous literature.

Conclusions

Neighborhood environment has a significant impact on women's fertility-willingness. We found that neighborhood type, the number of kindergartens in the neighborhood, and the neighborhood physical environment have significant impacts on women's fertility-willingness for a second child. In 2016, China's government changed from a one-child policy that was implemented more than 3 decades earlier to encourage couples to have 2 children. China's low fertility rate in the past 30 years is likely to have a serious negative impact on China's development in the next few decades. However, especially in urban areas, couples' enthusiasm for a second child is not high. Although the government cannot force couples to have a second child, it can help to improve women's fertility-willingness by improving the neighborhood environment, such as increasing the number of neighborhood kindergartens.

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