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**Whether to have an extra child or not? An integrative approach to parents'
reproductive decision-making in current China**

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Abstract

The worldwide transition to low fertility rate has led to introduction of multiple interdisciplinary frameworks to understand its causes and consequences. Resolving the falling fertility rate has been one of China's main challenges. Using the web-based survey data from a sample of 1,245 parents in Beijing, this study explores factors that affect the hypothetical decision of parents make when they consider whether to have an extra child. We will introduce a framework consists of 9 geographic variables - gender, age, number of siblings... - 5 indicator variables - attitude, sex preference, family support, financial burden, social norm - and test it using regression models. All indicators show a significant effect on parent's intentions to have an extra child. Furthermore, participants were randomly split into three groups given different amount of hypothetical government subsidy. The second part of this study explore the effect of the hypothetical government subsidy on parents' response in self-reported likelihood of having an extra child. I find that the 250 Yuan difference in monthly subsidy does not induce an increase in the self-reported likelihood of having an extra child. This could be explained by the fact that participants in this sample is a privileged group compared to both the average education level and annual family income in Beijing, so they are less likely to be motivated by monetary subsidy. It could also be the case that the cost of having an extra child in Beijing is so high that parents cannot be compensated by a 1000 Yuan monthly subsidy. Implications are analyzed in the context of recent government efforts to promote population growth.

Keywords: Fertility Intention, Fertility Behavior, Fertility Desire, Attitude, Sex Preference, Government Subsidy, Survey Methods, China

1. Introduction

1.1 Background

China's family planning policies are introduced from the 1950s "recommendation", and then evolved to the one-child policy started in 1970s, under which households exceeding the birth limit were penalized. The outcome of this policy is significant: the fertility rate has decreased from 5.72 in 1970 to 1.665 in 2015¹(The World Bank). China's universal two child policy, announced in October 2015, was enacted to ameliorate the nation's stagnant population growth, ageing population, and shrinking workforce. The policy targeted some 90 million women of reproductive age who had a previous delivery, and who would have been allowed to have a second child after October 2015. According to the Seventh National Census in 2020², the total fertility rate of women in childbearing age has decreased to 1.3, which is already a very low value. The annual average growth rate decreased to 0.53%, compared to the average annual growth rate from 2000 to 2010 was 0.57%, down 0.04 %. Statistics show that China's population has continued to maintain a low-speed growth trend for the past 10 years. Ning Jizhe, director of the National Bureau of Statistics of China, argued: "We should realize that low fertility levels are also a result of economic and social development. The level of fertility levels is not only affected by policy factors, but also by economic, social, cultural and other factors. The influence of the latter is gradually increasing."³

The theory of the Second Demographic Transition (Van de Kaa 1987, Lesthaeghe 2010) describes mainly about the change in people's values by the increasing individualism and the focus on self-realization. SDT has been accompanied by a move towards cohabitation by leaving the marriage. Children's perceived value has also changed: they are no longer regarded as the single central point in the life of a couple. There are many different frameworks that have been raised trying to explain the decreasing fertility rate (Shenk, Towner, Kress, & Alam, 2013): mortality and extrinsic risk, the economic costs and benefits of investing in self and children, and the cultural transmission of low-fertility social norms. In recent years, demographers focused their comparisons on fertility intention based on the theory of planned behavior (TPB) in social psychology. (Ajzen, 1991) TPB holds that behaviors are influenced by attitudes subjective norms and perceived control. Approaching differently, Lutz et al. (2005) developed "Low Fertility Trap Hypothesis" with three components: a

¹ <https://data.worldbank.org/indicator/SP.DYN.TFRT.IN?end=2019&locations=CN&start=1960&view=chart>

² By National Bureau of Statistics http://www.stats.gov.cn/tjsj/zxfb/202105/t20210510_1817176.html

³ <https://www.reuters.com/article/idCNL4S2MY1FO>

demographic one based on the negative population growth momentum; a sociological one based on assumption that young people would have decreasing ideal family size as their own experience; an economic one based on the first part of Easterlin's (1980) relative income hypothesis. They urge governments to take immediate action in order to escape from the expected trap.

Facing rapid economic development and rising price/consumption level, the parents in Beijing have to make trade-offs between having children and maintain high life quality. What would be the prevalence factor that influence decisions of parents who used to be single child to have an extra child? How should people explain the relationship between fertility desire and fertility behavior? How could government effectively encourage parents to increase fertility rate? We will explore these questions in this paper.

1.2 Research Purpose

The birth rate in China has decreased significantly since the announcement of the one-child policy started in 1970s. This achievement is attained by the compulsory effect of the policy but not based on people's own fertility desire or behavior. Under the background of the universal two child policy, we try to understand the relationships between fertility desire and potential influential variables. We examine nine geographic variables and 5 indicator variables - attitude, sex preference, family support, financial burden, social norm. Since many surveys in China show that many couples defer childbearing because of expense, particularly those living in large cities, we also explore the effect of government subsidies to newborn baby from 0 to 3 on the decision parents in big cities make when considering whether to have an extra child.

Furthermore, through the empirical research on fertility desire of target population and its influential factors, we are able to predict the population variation trend in the near future. In this way, we could provide more accurate and forward-looking framework for the adjustment and improvement of the population policy for the next generation, which allows the entire population development planning better adapted to resources, environment, and economic development. Ideally, the government could intervene the low fertility trap in society by taking immediate action on subsidies. This study would provide reliable data reference for following research on parents in urban areas like Beijing.

2. Theoretical Framework and Literature Review

2.1 Theoretical Framework

The changes in fertility willingness, fertility behavior, and fertility rate have always been the essential part of the population theory policy research. Western demographers have conducted extensive and in-depth investigations and studies on the reproductive willingness and reproductive behavior of people in developed and developing countries with fruitful results. Generally speaking, western fertility theories can be roughly divided into the following four types: The first is the economics theory of fertility, which analyzes from an economic point of view and focuses on discussing the influence of economic factors on fertility willingness, fertility behavior, and the impact of changes in fertility; the second is the theory of fertility sociology, the core of the theory is to examine the impact of non-economic social factors, such as marriage, family relations, education level, women's social status, quality of life, etc., on fertility choices and changes in fertility; the third is the theory of intermediary factors or the "closest determinant theory". This theory believes that whether it is economic or non-economic factors, intermediary factors such as marriage, pregnancy and contraception are able to affect fertility behavior and changes in fertility. The main emphasis is on the impact of demographic factors on the change of fertility; fourth is the theory of "biology-social factors", the core of which is to study the relationship between the reproductive behavior of the childbearing age population and sexual behavior, sex hormones, and sexual morality.

This study mainly uses the following theories as analytical frameworks:

2.1.1 Leibenstein "Rational choice of marginal child" theory

The theory of "Rational choice of marginal children" studies family fertility decision-making based on the framework of microeconomics cost-utility analysis(Leibenstein 1975). Leibenstein's goal is to construct a theory to explain the factors that determine the number of births that each family wants. The so-called "marginal children" refers to the newly added child in the last position that parents expect or plan to give birth to. Leibenstein first explained the cost-utility analysis and the calculation of children's production. He argues parents' fertility desire in family decision-making is mainly based on the comparison between cost and utility of the marginal child. Leibenstein divides children's costs into direct costs and indirect costs. Direct costs refer to various expenses spent by parents during the period from pregnancy to self-reliance of their children, including living expenses such as clothing, food, housing, transportation, education expenses,

medical expenses and so on. Indirect costs refer to the opportunities cost of education and income that parents lose to raise a new child. Therefore, they can also be called opportunity costs (opportunity cost mainly include: the loss in income and promotion opportunities during mother's pregnancy, childbirth, and breastfeeding period; education, mobility, and job opportunities lost by parents due to the care and rearing of new children, the decrease in life quality that parents and other family members might experience by raising an extra child. According to Leibenstein's point of view, children's utility can be divided into three main categories: The first category is to treat children as "consumption good", that is, parents treat children as a source of happiness. The utility obtained from the source can be said to be the utility of consumption; the second category is the utility obtained by treating the child as a "productive agent", that is the child can be expected to become a labor force and provide income to the family; the third category is the utility expected from children as a potential source of old age security. Leibenstein assumes each family will determine whether to have the nth child in the family based on the comparison between the utility and the negative utility brought by the nth child. When the utility of the marginal child is greater than the negative utility, the family decides to have the child, and vice versa.

2.1.2 G. Becker "Quantity vs. Quality" theory

G. Becker's classic paper "Economic Analysis of Fertility Rate" published in 1960 is the founding work of contemporary western population economics. The substitution theory regards the quantity and quality of children as two kinds of durable goods and believes that there is a mutual substitution relationship between the two (Becker, 1988). Becker argues that when family income levels increase, people would rather choose children with fewer numbers and higher quality than children with higher numbers and lower quality. Becker put forward such a famous hypothesis: if the child's net cost is positive, that is, the parent's contribution to support is higher than the income provided by the child, then the demand for the child will be reduced; if the child's net cost is negative, that is, if the investment of parents is lower than the income, the demand for children will increase.

2.1.3 JC Caldwell "Wealth flow" theory

Australian demographer John C. Caldwell proposed the intergenerational "wealth flow" theory, which is used to analyze the social mechanism of fertility changes. He advocates using the perspective of social relations to analyze fertility changes rather than economic perspectives(Caldwell 2005). He believes that the fundamental condition that determines the level of fertility is the net flow of family relations, especially the net flow of intergenerational wealth

within the family. The essence of this family relationship flow is the modernization of the family relationship measured by the "wealth flow" between the parents and the offspring. He concludes that reproductive behavior is based on rational choice, but the mechanism of change is through society. The transition between high fertility rate and low fertility rate depends on whether the direction of wealth flow between the offspring and the father within the family. Once the possession of family wealth changes and family wealth begins to flow from parents to children, the family and the entire society will experience a downward trend in fertility. Although his research focuses on the wealth issue within the family, what he wants to discuss is the social mechanism within the family, which is the social relationship. He believes that social changes have changed the family structure and in hence caused the decrease in fertility rate.

2.1.4 Maslow's hierarchy of needs

Maslow regards people's inner psychological needs as five levels from low to high: physiological needs; safety needs; belongingness and love needs; esteem needs; self-actualization needs. People can only pursue higher-level pursuits if they meet or alleviate the lower-level needs. From physiological needs to self-esteem needs, it is relatively easy to meet, while self-actualization is the pinnacle that fully reflects the ideal meaning and value of people's lives. It is generally believed, especially in Chinese context, that by giving birth to children, one is able to become a person with a complete personality, which embodies such a spiritual pursuit.

2.2 Literature review

2.1.1 Western related literature review

In the 21st century, many new changes have appeared in various fields such as population, economy, and society. These new changes have led to new developments in various fertility theories. Many scholars have used fertility economics, fertility sociology, intermediary variables, population biology and other theoretical analysis to conduct a large number of empirical studies on fertility willingness, fertility behavior, fertility rate and its influencing factors. From the perspective of research area, it can be divided into research of fertility issues in developed and developing countries; from the perspective of research content, it mainly discusses the relationship between fertility issues and factors such as economy, society, national policies, and personal psychology. Adsera (2006) studied the influence of economic factors on people's fertility willingness and fertility behavior. Using data from the Spanish Fertility Surveys (SFS) in 1985 and 1999, it was

revealed that Spain's contracting labor market in the past two decades and the deteriorating economic conditions is an important reason for the gap between the number of women expected of their children and the actual fertility level. She believes that the fertility rates in Spain and other European countries have undergone major changes in the past 20 years. With the overall fertility rate in Europe showing a downward trend, Spain's fertility rate has fallen the most. The fertility rate in Spain dropped from 2.8 in 1975 to 1.15 in 1997. It was only in recent years that the fertility rate has risen, but the current fertility rate is only 1.2. She argues that although many current studies on fertility have emphasized the availability of contraceptive measures, couples' preference for choice, and the religious composition of the family, the economic situation, more specifically unemployment, is what causes women's expectations of the number of children and the actual number of children. The high unemployment rate directly leads to the delays in childbirth by increasing large amount of economic uncertainty among young Spanish people. Through further research, Adsera found that in terms of career choices, positions in the public sector are more conducive to alleviating the difficulties faced by women than those in the private sector, so as to achieve the ideal childbirth goal.

Ivan Lukšík et al.(2016) studied fertility behavior from the perspective of social psychology. They use the theory of planned behavior(TPB) proposed by Ajzen. The theory of planned behavior theory believes that human behavior patterns will be affected by three internal factors: personal behavior attitude, subjective norms, and perceived behavior control. They conduct a case study with young people in Slovakia, aged between 24 and 36 who already had one child at the time of data collection and had no health issues preventing them from having another child. The survey contains a specially designed module based on the theory of planned behavior to investigate the relationship between respondents' normative pressures and their social networks. The results show that the three components of the theory of planned behavior, namely personal behavior attitude, subjective norms, and perceived behavior control, have broad predictive properties for the willingness to bear children. Among them, attitudes and subjective norms are significantly related to the willingness to bear children. The results also confirm that gender affects reproductive planning.

Arnstein Aassve (2008) studies the effect of government policy on fertility rate. He reviews the changes in the European population in recent years and analyzes the reasons for the continued decline in the European population's birth rate. Aassve argues that although some people claim the changes in population fertility patterns in recent years are largely due to changes in people's fertility

attitudes and the repositioning of values, government intervention is an important reason why actual population fertility behavior varies from country to country. It is worth noting that new and modern forms of social phenomena, such as cohabitation and childbirth out of wedlock, are all associated with higher fertility rates. This is largely because of the government's welfare programs within the country.

2.1.1 Chinese related literature review

On December 31, 2015, the CPC Central Committee and the State Council jointly issued the “Decision on the implementation of a comprehensive two-child policy to improve management of family planning services”. The objectives are “to promote long-term balanced population development, help to optimize the population structure by increasing labor supply and slowing down population aging, to promote sustainable economic and social development and ultimately achieve the goal of a moderately prosperous society and social harmony.” (Xinhua 5 Jan. 2016) The available statistics indicate that the relaxation of the one-child policy announced in late 2013 did not achieve great success. By the end of 2014, of the roughly 11 million couples in the country made eligible for a second child by the policy change, only 1.07 million had filed a request for permission to have a second child (Isabelle Attané, 2016). In today’s China, having children is not as an important priority for couples as in the past, and any decision to do so now is based on the calculation of costs and benefits associated with raising a child. Four decades of propaganda in favor of birth limitation, of course, played a decisive role: women in China’s urban areas gradually came to the politically ‘conscientious acceptance’ of the one-child family. Simultaneously, the government failed to actively support families in their reproductive and educational mission in the broad sense: exemplified by virtually nonexistent social and financial assistance, education and health care costs borne by individuals, high costs of childcare for very young children, and weak legal protections for mothers within the labor market. As a consequence, children now require heavy sacrifices on the part of their parents. (Isabelle Attané, 2016) As we can tell, reviving fertility in a country where norms in favor of small families are well rooted will be difficult. One possible way to encourage more Chinese couples to have second child would be to provide policy supports in various aspects.

Mother's attitudes towards having a second child are also an important factor underlying her ideal family size. Husband's and the firstborn child's attitudes are also critical to the willingness of

having an extra child, which in turn played a decisive role in her intention to have a second child. By contrast, economic constraints—e.g., work-family conflict, pressure in raising children and difficulty to find a quality kindergarten for children—played a minor role in influencing both desire and intention to have a second child.(Jianghua Liu & Virpi Lummaa 2019)

3. Data and Methods

3.1 Sampling and Data Collection

The data was collected through an online self-administrated survey I designed provided by a Chinese survey platform Wenjuanxing (<https://www.wjx.cn/>). After I created the content of questionnaire, I delivered the surveys/questionnaires to the manager of CRADLE EDU⁴, who then distributed to the participants mainly their current or potential customers (parents). CRADLE EDU is created in 1996 and rooted in a profound respect for children and providing them with the very best start in life. It has around 600 kindergartens and early day care centers in China and serviced more than 100,000 kids. In this way, we could collect data efficiently from the proper sample. The only concern here is our sample might be classified with privileged social status as CRADLE EDU is a private, high quality early education center. Trying to alleviate this bias, we distributed surveys to public preschools and private preschools according to the required coverage rate in China ⁵(80% vs. 20%). The survey was distributed between April 5th, 2020 and April 11th, 2021. In the end, we have collected in total 1245 survey responses. In order to study the effect of government subsidy, I manually divided them into three groups by changing the amount of government subsidy by 250 Yuan after around 400 and 800 responses. In this way, we could make these three groups as similar as possible.

⁴ The website for the company: <http://www.mamababy.com/>

⁵ <http://www.lawinfochina.com/display.aspx?id=29398&lib=law&SearchKeyword=&SearchCKeyword=>

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Table1 Sample Characteristic

Variables	Categories	Group1(N=417)		Group2(N=392)		Group3(N=436)	
		Frequenc y	Percentage(%)	Frequenc y	Percentage(%)	Frequenc y	Percentage(%)
Gender	Female	354	84.89	355	90.56	393	90.14
	Male	63	15.11	37	9.44	43	9.86
Age	Under 30	36	8.63	57	14.54	53	12.16
	30 ~ 34	179	42.93	203	51.79	222	50.92
	Above 34	202	48.44	132	33.67	161	36.93
# of siblings	0	108	25.90	104	26.53	135	30.96
	1	124	29.74	123	31.38	154	35.32
	2 or more	185	44.36	165	42.09	147	33.72
Education	Regular High School or below	72	17.27	72	18.37	107	24.54
	College Degree	307	73.62	284	72.45	304	69.72
	Master's degree or above	38	9.11	36	9.18	25	5.73
Local Hukou	Yes	331	79.38	336	85.71	287	65.83
# of children	No	86	20.62	56	14.29	149	34.17
Age of children	1	254	60.91	251	64.03	276	63.30
	2	163	39.09	141	35.97	160	36.70
	Below 3 years old	40	9.59	21	5.36	36	8.26
Employment status	3-6 years old	202	48.44	273	69.64	309	70.87
	Above 6 years old	175	41.97	98	25.00	91	20.87
	Full-time	288	69.06	263	67.09	278	63.76
HH Annual Income(In Yuan)	Part-time	29	6.95	28	7.14	23	5.28
	Self-employed	41	9.83	51	13.01	61	13.99
	Unemployed/retired	5	1.20	3	0.77	3	0.69
HH Annual Income(In Yuan)	Househusband/wife	54	12.95	47	11.99	71	16.28
	Less than 8,0000	56	13.43	37	9.44	78	17.89
	8,0001 ~ 13,0000	88	21.10	65	16.58	111	25.46
	13,0001 ~ 18,0000	51	12.23	57	14.54	70	16.06
	18,0001 ~ 23,0000	60	14.39	67	17.09	66	15.14
HH Annual Income(In Yuan)	23,0001 ~ 28,0000	30	7.19	35	8.93	27	6.19
	8,0001 ~ 33,0000	41	9.83	41	10.46	20	4.59
	Above 33,0000	91	21.82	90	22.96	64	14.68

*The table above presents the detailed characteristics of this sample.

Table 1 above provides a descriptive overview of the sample and includes all demographic variables we will use in the following analyses. According to Table 1, this survey yields a female dominated (88.48%), highly educated(80% higher or equal to 4-year college degree), and relatively high-income sample in China. Most of the respondents are in their 30s or 40s, and typically hold a four-year college degree. 72% of the participants have at least one sibling, and 76.6% of them have local Hukou. More than half of the sample (66.7%) are full-time employed, 13% report as househusband/wife, and the median annual household income is around 200,000 RMB. Compared to the Chinese population, which has 15.5% people who has a bachelor's degree⁶ (National Bureau of Statistics); and 80,000 RMB ⁷average annual income (National Bureau of Statistics), this sample obviously presents a privileged group.

3.2 Research Questions and Hypotheses

Research Question 1: What is the prevalence factor that influence Chinese parents' plans to have a second child in Beijing area?

Research Question 2: Would a monthly subsidy from government to 0–3-year-old induce parents to have an extra child?

- Hypothesis 1: Attitudes have positive influence on plans to have a second child.
- Hypothesis 2: An increased awareness of social pressure from the social environment to have a child positively influences plans to have a second child.
- Hypothesis 3: Greater control over the circumstances of reproduction and more family support positively influence plans to have a second child.
- Hypothesis 4: Monthly government support toward 0–3-year-old positively influences plans to have a second child.

⁶ http://www.stats.gov.cn/tjsj/zxfb/202105/t20210510_1817176.html

⁷ http://www.stats.gov.cn/tjsj/zxfb/202105/t20210510_1817176.html

3.3 Variables and Measurements

3.3.1 Measurement

Besides the demographic questions, this survey includes 5 subjective variables we want to measure: attitude, sex preference, family support, financial burden, and social norm. Each of them contains three sub questions. For each behavioral question, we ask the participants twice: the first time we ask them how likely they think it will happen, which is an indicator of likelihood denoted by p . Respondents answered each question on a seven-point scale from 1 – Unlikely to 7 – Likely. The important feature of these items is that the respondent is making a judgement about the probability that a given item is true. The second time we ask respondents how much these items concern them, which is an indicator of preference denoted by q . Respondents answered each question on a five-point scale from 1 – not concerned to 5 – very concerned. The score for each question is calculated by multiplying the score of the unlikely-likely scale by the relevant evaluation score on the not concerned /very concerned scale ($Y=P*Q$). The overall score of each variable is the sum of the score for its sub questions. (See Box 1 for question and response formats.)

In order to check the robustness of the current model, we tried the principal component analysis to construct the index of Attitude. The $qnorm$, distribution and regression results are roughly the same as before. We also tried to construct the index by multiplying components as a geometric average. However, as we arranged some questions in a negative way, there is no way we could multiply different components in a proper way. Therefore, we decide to use the current $p*q$ method as it is more straightforward to construct the index of measurement.

We asked respondents about their fertility desire in the survey: How likely will you have an extra kid in the near future? The answer is a percentage indicating the likelihood range from 3 to 100 with mean 37.78. By splitting the sample into three groups, I changed the amount of government subsidy from 750 RMB to 1000 RMB and 1250 RMB.⁸The survey asks respondents how likely you will have an extra kid if the government provides a monthly subsidy to the family with children aged 0-3. The result ranges from 0 to 100 with mean 45.74. Please check table 2 for more detailed description about how I calculate the score for each indicator.

⁸ Beijing government provides subsidy of 700 RMB per month to 3–6 years old children in kindergarten from 2018. <http://www.chinadaily.com.cn/a/201801/04/WS5a4e1f09a31008cf16da522b.html>

Table 2 Score Calculation

<i>Box 1 Example, scoring procedure for Attitude</i>	
Likelihood(p)	
A. If your child is an only child, he/she might occasionally feel lonely.	Unlikely 1 2 3 4 5 6 7 Likely
B. Hypothetically, having two children is more likely to be beneficial to your old age security.	Unlikely 1 2 3 4 5 6 7 Likely
C. In your opinion, two children will be more reliable because they may leave home when they grow up.	Unlikely 1 2 3 4 5 6 7 Likely
Preference(q)	
a) How do you feel about having your child experience loneliness?	Not concerned 1 2 3 4 5 Very concerned
b) How do you feel about having a secure old age?	Not concerned 1 2 3 4 5 Very concerned
c) How do you feel if your only child might leave you when he/she grows up?	Not concerned 1 2 3 4 5 Very concerned
<p>Imagine that a participant has responded by circling the numbers indicated in <i>bolded italics</i> above.</p> <p>The total attitude score is calculated as</p> $A = (5 * 2) + (2 * 4) + (6 * 1)$ $= 10 + 8 + 6$ $= 24$	
<p>THEREFORE, THE ATTITUDE SCORE OF THE PARTICIPANT REFLECTS A WEAK TO MODERATE POSITIVE ATTITUDE (i.e. IN FAVOUR OF HAVING AN EXTRA CHILD)</p>	

3.3.2 Dependent Variable

The dependent variables are the percentage change of likelihood of having an extra kid that participants report based on the subsidy given by the government.

3.3.3 Independent Variables

There are six independent variables that may influence people's fertility desire: 1) Attitude, 2) Sex preference, 3) Family support, 4) Financial burden and 5) Social norm. Each variable has three components as mentioned above, please see appendix for the histograms of the main variables.

3.3.4 Control Variables

We have nine demographic questions at the beginning of the survey to represent nine control variables.

1. Gender of the participant, 0 for female and 1 for male.
2. Age of the participant, 1 for under 30, 2 for 30~34, 3 for above 34.
3. Number of siblings of the participant, coded continuously.
4. Education of the participant, 1 for Regular High School or below, 2 for 4-year College Degree, 3 for master's degree or above.
5. Local Hukou status of the participant, 0 for no, 1 for yes.
6. Number of children of the participant, coded continuously.
7. Age of children, 1 for below 3 years old, 2 for 3-6 years old, 3 for above 6 years old.
8. Employment status of the participant, categorized into Full-time, Part-time, Self-employed, Unemployed/retired, Househusband/wife.
9. Household Annual Income(In Yuan) categorized into "under 8,0000," "8,0001 ~ 13,0000," "13,0001 ~ 18,0000," "18,0001 ~ 23,0000," "23,0001 ~ 28,0000," "28,0001 ~ 33,0000" and "Above 33,0000".
10. Group, 1 for the group of participants who receive 750 RMB subsidy per month, 2 for the group of participants who receive 1000 RMB subsidy per month, 3 for the group of participants who receive 750 RMB subsidy per month.

4. Results

4.1 Data Analysis and Correlations

There are five independent variables that may influence people's fertility desire: 1) Attitude, 2) Sex preference, 3) Family support, 4) Financial burden and 5) Social norm. Each variable has three components as mentioned above, please see the questionnaire for more details. The last dummy variable is the Group, which is the hypothetical amount of government subsidy participants receive in the survey.

In table 3, we show the results of correlations between all variables, including dependent variable, independent variables, and control variables. We can tell the number of siblings, number of children, attitude, sex preference, family support, social norm and overall intention of participants all have significantly positive correlations with parent's fertility decision. Education, on the other hand, have significantly negative correlation with their fertility decision. It is not surprising to find such results based on the literature review, but it is important to notice that both group (indicator of the amount of subsidy) and financial burden are not significantly correlated with our dependent variable. The negative correlation between education and fertility decision could be explained by Becker's Quality vs Quantity theory. When family income and education levels increase, people would rather choose children with fewer numbers and higher quality than children with higher numbers and lower quality. As for the financial burden indicator, I ask participants if having an extra child will hurt their career development; if they could bear the economic pressure from the extra child; if one of the parents will become a househusband/wife to take care of the extra child. It might be the case that parents in Beijing are already financially well-prepared before they consider having a child, therefore this indicator is sort of irrelevant for participants. However, it is surprising that different amount of subsidy does not have a significant effect on parent's decision toward having an extra child. It can be explained by the high monthly cost for a new-born baby in Beijing. The difference of 250 RMB cannot significantly change people's fertility intention.

Table3 Correlation Results Among Variables

	Government effect	Group	Gender	Age	# of siblings	Education	Local hukou	# of children	Age of children	Employment	Annual income	Attitude	Sex preference	Family support	Financial burden	Social norm
Government effect	1.00															
Group	0.02	1.00														
Gender	0.07	-0.07	1.00													
Age	0.05	-0.09	0.12	1.00												
# of siblings	0.11	-0.08	-0.11	0.12	1.00											
Education	-0.11	-0.09	0.12	0.07	-0.16	1.00										
Local hukou	0.01	-0.13	0.01	0.08	-0.10	0.15	1.00									
# of children	0.41	-0.02	-0.05	0.20	0.14	-0.14	0.01	1.00								
Age of children	0.02	-0.14	0.02	0.37	0.12	-0.07	0.04	0.15	1.00							
Employment	0.07	0.05	-0.13	-0.01	0.11	-0.27	-0.05	0.19	0.00	1.00						
Annual income	-0.03	-0.12	0.03	0.06	-0.01	0.23	0.03	0.02	0.01	-0.01	1.00					
Attitude	0.42	-0.01	0.06	0.08	0.15	-0.09	-0.03	0.26	0.04	0.03	-0.02	1.00				
Sex preference	0.36	-0.01	0.13	0.04	0.14	-0.11	-0.06	0.16	0.00	0.00	-0.04	0.63	1.00			
Family support	0.30	-0.07	0.03	0.03	0.01	0.04	-0.02	0.29	-0.04	0.03	0.08	0.45	0.48	1.00		
Financial burden	0.05	-0.08	-0.04	0.02	0.11	-0.05	-0.09	0.07	0.02	0.11	0.03	0.28	0.28	0.35	1.00	
Social norm	0.34	-0.04	0.09	0.01	0.08	-0.08	-0.09	0.24	-0.01	0.02	-0.04	0.59	0.56	0.52	0.37	1.00

4.2 OLS Models

4.2.1 Model construction

I construct OLS model 1 as:

$$Y = \alpha + A + \beta Amount + \epsilon$$

A represents all control variables (9 geographic variables);

Amount is calculated as $(500 + group * 250) / 100$, which stands for the real amount of subsidy provided by government in unit of 100 RMB.

OLS model 2:

$$Y = \alpha + A + \beta Amount + \gamma Attitude + \delta Sex preference + \varphi Family support + \theta Financial ability + \omega Social norm + \epsilon$$

A represents all control variables (9 geographic variables);

The rest of indicators are measured by standardizing the score calculated as the formula of table2.

OLS model 3:

$$Y = \alpha + A + \beta \textit{Amount} + \gamma \textit{Attitude} + \delta \textit{Sex preference} + \varphi \textit{Family support} \\ + \theta \textit{Financial ability} + \omega \textit{Social norm} + \vartheta \textit{Amount} * \textit{Attitude} \\ + \rho \textit{Amount} * \textit{Sex preference} + \tau \textit{Amount} * \textit{Family support} + \mu \textit{Amount} \\ * \textit{Financial ability} + \pi \textit{Amount} * \textit{Social norm} + \epsilon$$

A represents all control variables (9 geographic variables);

In model 3, I try to explore the interaction between amount of subsidy and different indicators to see if they are significant and in which direction.

4.2.1 OLS results

Based on the result in table 4, we can tell male participants report significantly higher intention toward having an extra child than female participants across all models. This could be explained by the fact that female tend to bear more responsibility in family to take care of the children and suffer more loss in the career than male. The significant negative coefficient of financial burden suggests that in modern social and economic life, the occupational status of people of childbearing age, especially women, has an important influence on the willingness to bear children. The significantly high positive coefficient for the number of children indicate that parents are more than 20% likely to have an extra child by each child they already have. The significant positive coefficient of attitude indicate that parents are mainly influenced by their own opinion toward fertility decision, and it is very challenging for external forces (government, etc.) to change people's opinions. The significant positive coefficients of sex preference and social norm show that even in an urban society with highly developed technology and culture, people's fertility intentions are still affected by the traditional fertility concepts. The coefficient for the hypothetical amount of subsidy, and its interaction with other indicator variables are all insignificant across models. This shows participants in this sample are indifferent of the monthly subsidy answering the self-reported likelihood of having an extra child. This could be explained by the fact that this is a privileged group compared to both the average education level and annual family income in Beijing, so they are less likely to be motivated by monetary subsidy. It could also be the case that the cost of having an extra child in Beijing is so high that parents cannot be compensated by a monthly subsidy around 1000 Yuan.

Table4 OLS Regression Results

Variables	OLS1	OLS2	OLS3
Gender	12.24*** (3.112)	6.424** (2.784)	6.326** (2.766)
Age	-7.559 (9.359)	-4.682 (8.520)	-5.184 (8.520)
Age Square	1.299 (2.135)	0.635 (1.952)	0.749 (1.955)
Number of siblings	3.214*** (1.232)	1.694 (1.149)	1.645 (1.153)
Education	-3.468* (2.073)	-1.950 (1.915)	-1.970 (1.909)
Local Hukou	2.339 (2.265)	2.996 (2.091)	3.230 (2.092)
Number of children	31.313*** (2.114)	23.394*** (2.180)	23.298*** (2.187)
Age of children	-2.844 (1.782)	-1.626 (1.612)	-1.661 (1.606)
Employment status	-0.421 (0.700)	0.207 (0.652)	0.198 (0.654)
HH Annual Income (In Yuan)	-0.333 (0.476)	-0.190 (0.439)	-0.170 (0.442)
Amount	5.423 (4.712)	5.265 (4.393)	5.170 (4.347)
Attitude		7.965*** (1.362)	15.159** (6.832)
Sex preference		4.474*** (1.299)	10.602 (6.877)
Family support		2.143* (1.214)	-2.827 (6.060)
Financial burden		-4.326*** (0.970)	-4.720 (4.844)
Social norm		2.888** (1.332)	-2.959 (6.683)
Amount*Attitude			-7.206 (6.678)
Amount*Sex preference			-6.214 (6.642)
Amount*Family support			5.107 (6.008)
Amount*Financial burden			0.411 (4.792)
Amount*Social norm			5.911 (6.638)
Constants	8.367 (8.890)	16.499* (11.547)	17.201* (11.496)
N	1245	1245	1245
R2	0.185	0.306	0.309

Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The dependent variables are the percentage change of likelihood of having an extra kid that participants report based on the hypothetical subsidy given by the government. All detailed information regards to the control variables and independent variables are listed in pg.15 from one to ten. The product of two variables represents the interaction between them.

5. Discussion

In summary, the result of this study shows that parents in Beijing area who participated in this survey tend to have very strong correlations between fertility intention and gender, number of siblings, number of children, attitude, sex preference, financial burden, and social norm. Neither the subsidy offered by government, nor its interactions with indicator variables has significant effect on parent's fertility intention. This might be explained by the fact that the respondents in this survey are not very sensitive to the price of early education. The amount of the hypothetical subsidy around 1000 RMB from government is not enough for parents to change their decision. As I mentioned above in the data section, this sample obviously presents a privileged group compared to both the average education level and annual family income in Beijing.

The significant positive effect of gender and significant negative effect of financial burden suggests that in modern social and economic life, the occupational status of people, especially women, has an important influence on the willingness to bear children. In cities, most women of childbearing age are engaged in occupations closely related to modern production methods. In the face of fierce competition, they are often in a dilemma between working hard and taking good care of their children. Therefore, their willingness to bear children are relatively low. It will be the government's job to improve the corresponded law and regulate employers in order to protect female workers. The strong effect of the number of children indicate that policy makers should focus more on parents who do not have child and find ways to induce them to realize the change from zero to one. The rest of the parent who already have children are more likely to raise an extra one. The significant positive effect of attitude illustrates that parent are mainly influenced by their own opinion toward fertility decision, so that would be an important breakthrough which policy makers could use to improve the fertility rate. The effect of sex preference and social norm show that traditional concept of fertility still affects the willingness and behavior of children of childbearing age, the quantity and quality of the population, and thus affects the development of society, and directly determines the status and living conditions of women who are responsible for reproductive tasks. It is critical to strengthen the propaganda of the new policy, so the majority of childbearing age groups could understand the benefits and

actively have an extra child in accordance with the new policy.

If a country's low fertility rate continues for a long time, its pension system, medical system, intergenerational equality, economic competitiveness, political and cultural influence will all face severe challenges. Population policy adjustment is imperative. In May 2021, Chinese government has just announced that it will allow couples to have up to three children, after census data showed a steep decline in birth rates. The problem now is how to motivate parents to follow the policy.

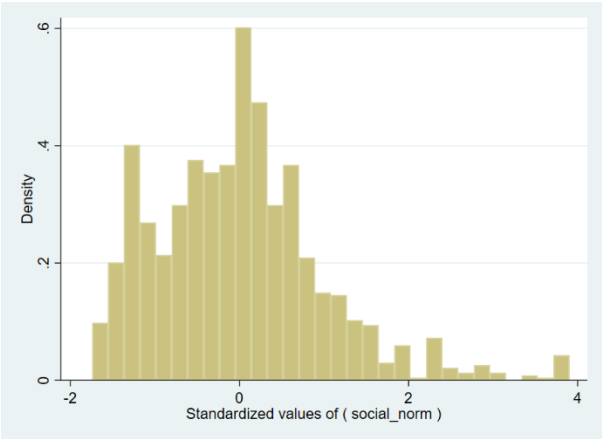
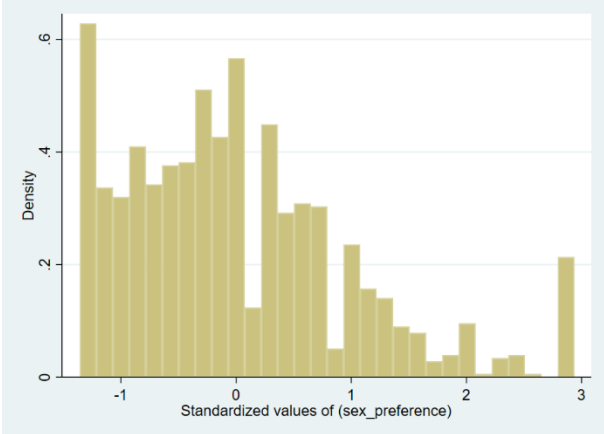
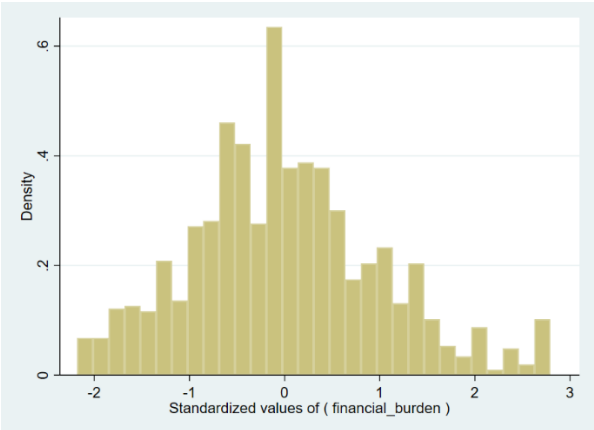
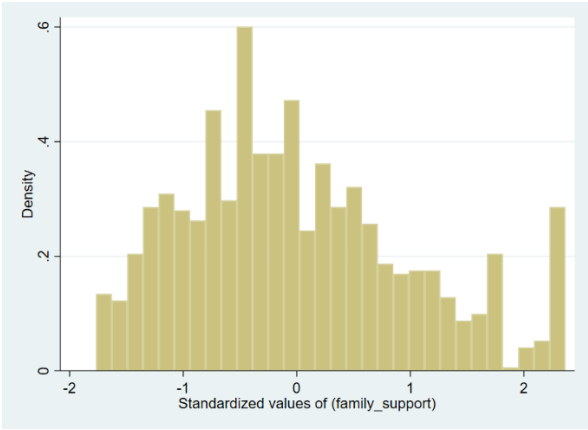
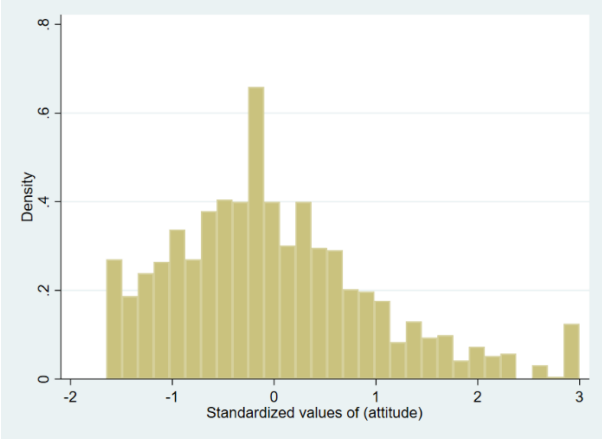
There are some limitations in this study. First, this sample is not representative for the entire Chinese population or even Beijing population due to their high education level and annual family income, and this might partially explain the insignificant coefficient for the subsidy. However, limited by funds and resources in China, this is the best sample we could collect. Second, the survey content involves many sensitive topics related to fertility, and some problems also involve personal opinions, which might cause some parents of childbearing age to be unwilling to be completely honest. Third, the hypothetical government subsidy and self-reported likelihood of having an extra kid might not be hundred percent accurate in reality, but again, this is the best sample we could collect.

This study has four implications. First, facing with the severely unbalanced gender structure of the population, gender discrimination should be eliminated in the whole society and a new concept of fertility should be established: the role of education should be emphasized. Education is an important way to improve people's level of thinking and understanding. The breadth and depth of popularization of education directly affects the quality of the population. To establish a new concept of fertility, the government should first improve the scientific and cultural quality of people of childbearing age. Second, the government should optimize family planning service management by simplifying the work process, canceling the approval of childbirth within three children. In this way, parents could realize the family's independent birth arrangements. Third, governments at all levels should increase the capacity in hospital for pregnant women and neonates by cutting the shortage of pediatric and obstetric medical staff. More importantly, the government need to focus on the forward-looking allocation of basic public service resources such as nurseries, kindergartens, primary and secondary schools in order to meet the requirements for public resources. Fourth, the government must strengthen the propaganda of the new policy, so the majority of childbearing age groups could understand the

new policy and actively have an extra child in accordance with the new policy.

Future research work can be improved from the following aspects: larger urban and rural areas can be used as survey sites, and the sample size can be expanded as much as possible to enhance the representativeness of the samples and the reliability of the survey data; the amount of subsidy could be estimated by professional officers in local area so it could be effective; proceeding from the inherent relevance of childbirth willingness, researchers could focus more on the details in the psychological side of parents' fertility intention.

Appendix



*The figures above are the histograms of the standardized values of main indicators in our study.

Bibliography

- Aassve, Arnstein. (2008)“. Demographic Change: How Government Support Influences Birth Rates.” *European View* 7, no. 2: 209–16.
- Adsera, A. (2006). “An Economic Analysis of the Gap Between Desired and Actual Fertility: The Case of Spain.” *Rev Econ Household* 4, 75–95
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T).
- Attané I. (2016). “Second child decisions in china second child decisions in china.” *Population and development review* 42(3):519-536.
- Becker, G. S., & Lewis, H. G. (1973). “On the Interaction between the Quantity and Quality of Children.” *Journal of political Economy*, 81(2, Part 2), S279-S288.
- Becker, Gary S., and Robert J. Barro.(1988). "A Reformulation of the Economic Theory of Fertility." *The Quarterly Journal of Economics* 103(1), 1-25
- Caldwell, J. (2005). “On Net Intergenerational Wealth Flows: An Update.” *Population and Development Review*, 31(4), 721-740.
- Francis, J., Johnston, M., Eccles, M., Walker, A., Grimshaw, J. M., Foy, R., Kaner, E. F. S., Smith, L., & Bonetti, D. (2004). “Constructing questionnaires based on the theory of planned behaviour: A manual for Health Services Researchers.” *Quality of life and management of living resources*; Centre for Health Services Research.
- Harvey Leibenstein. (1975). “The Economic Theory of Fertility Decline.” *The Quarterly Journal of Economics*, Volume 89, Issue 1, February 1975, Pages 1–31
- Jiang, Zhenghua, et al. (2017). "The Fertility Level of China's Population: Analysis of Microdata From the 2010 Census." PAA 2017 Annual Meeting.
- Jianghua Liu, Virpi Lummaa. (2019). “Whether to have a second child or not? An integrative approach to women's reproductive decision-making in current China.” *Evolution and Human Behavior* 40 (2019) 194–203
- Lesthaeghe, Ron. (2010). “The Unfolding Story of the Second Demographic Transition.” *Population and Development Review* 36(2):211–51.
- Liu, J. and V. Lummaa. (2019). “Whether to have a second child or not? An integrative approach to women's reproductive decision-making in current China.” *Evolution and Human Behavior* 40: 194-203.
- Lukšik, Ivan, Gabriel Bianchi, Miroslav Popper, and Pavol Baboš. (2016). “Factors Affecting Decisions to Have a Second Child: Exploiting the Theory of Planned Behaviour.” *Polish Psychological Bulletin* 47 (4): 421–30.
- Lutz, Wolfgang, Vegard Skirbekk, and Maria Rita Testa. (2006). "The Low-Fertility Trap Hypothesis: Forces That May Lead to Further Postponement and Fewer Births in

- Europe." *Vienna Yearbook of Population Research* 4: 167-92.
- McLeod, S. A. (2020). "Maslow's hierarchy of needs." *Simply Psychology*.
- Philip Morgan, S. (2003). Is low fertility a twenty-first-century demographic crisis? *Demography* 40, 589–603.
- Shenk, M. K., Towner, M. C., Kress, H. C., & Alam, N. (2013). "A model comparison approach shows stronger support for economic models of fertility decline." *Proceedings of the National Academy of Sciences of the United States of America*, 110(20), 8045–8050.
- Sobotka, Tomas & Matysiak, Anna & Brzozowska, Zuzanna. (2020). "Policy responses to low fertility: How effective are they?" 10.13140/RG.2.2.36394.16329.
- Van De Kaa, D. J. (1987). "Europe's Second Demographic Transition." *Population Bulletin* 42(1):1–59.
- Warren C. Robinson. (1997). "The Economic Theory of Fertility Over Three Decades." *Population Studies*, 51:1, 63-74