

How Birth Ratio in A Family Affects Household Happiness?

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ABSTRACT

For a quite long time, in China, the gender ratio of children in Chinese families has shown a statistical fact that it is constantly increasing and seriously deviating from the normal range, which is 103-107. The causes of the imbalance in the sex ratio of the children are extremely complex, while the consequences are extremely serious as well. This paper uses CHIP survey data, taking the household consumption expenditure on non-essential goods as a proxy variable for the household happiness, and using the least squares estimation and the maximum likelihood estimation to make empirical analysis, comparing the differences in household happiness with different children's gender. The research results show that daughters can bring higher level of happiness to the family than what sons can. This conclusion may have certain guiding significance for solving the problem of China's gender ratio imbalance.

Keywords: Gender ratio, Family Happiness, Empirical Research

1. INTRODUCTION

Sex ratio is the demographic concept that measures the proportion of males to females in a given population. The gender ratio of children refers to the proportion of sons to daughters in the family in a certain period of time. According to the empirical data, the normal range of this ratio is generally between 103 and 107 (that is, for every 100 girls born, 103 to 107 boys are born). However, for a quite long time, the gender ratio of children in Chinese families has shown a statistical fact that it is constantly increasing and seriously deviating from the normal range. In the 1980s, since the implementation of the family planning policy in the 1980s led to a cliff-like decline in the birth rate, population growth has slowed down and population control has achieved remarkable results. However, any gains come at a price. China's low birth rate brings problems such as a high gender ratio of children as well. As shown in Figure 1, the sex ratio at birth in China had been out of normal range which is 103 to 107 as mentioned before and reached 108.5 in 1982. After that, it remained high since the mid to late 1980s. In the beginning of the 21st century, the sex ratio of children in the family continued to run at a high level, which peaked at 118.6 in 2005, and began to decline after 2010. In 2017, this number is 111.9, but still stayed above normal levels.

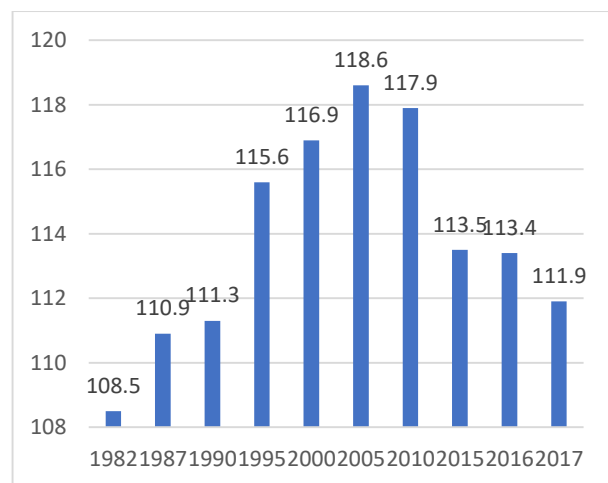


Figure1 Sex ratio at birth of China from 1982 to 2017

Source: National Bureau of Statistics

The causes of the imbalance in the sex ratio of the children are extremely complex, while the consequences are extremely serious as well. One of the reasons is the influence of traditional culture. In the feudal farming society with the history of more than 2000 years, China has gradually formed a traditional fertility culture of son preference. Ancient Chinese people believed that more sons meant more blessings. They raised children for supporting care when they got old. This traditional

culture has far-reaching influence and is still deeply rooted in many places, which is the social and cultural root of the preference for boys. Economic foundation played a particularly important part in this process. In many rural areas, due to the lack of productivity, production and life mainly rely on physical labor. A lot of heavy physical labor needs to be undertaken by men, and people place their hope of becoming rich on men as well. At the same time, the rural social security system was not perfect so men were needed to protect the safety of people and asset. These are the economic basis of boy preference. Besides that, gender inequality still exists. There is still a certain gap between women and men in terms of educational opportunities, employment opportunities, labor distribution, political participation, etc., which also promotes people's desire to have children in favor of boys.

There are lots of severe impact of the imbalance in birth gender ratio. On the one hand, when this generation grows up, it will further aggravate the status quo of gender imbalance and affect social stability; on the other hand, in the social unit of the family, children as family members, their gender-structure imbalance will inevitably have an impact on the socio-economic status of the family. At present, the analysis of the causes of the gender ratio of family children has been widely regarded. However, there is not much research on the influence of family-child gender ratio on other social factors, especially at the meso level, the impact of family-child sex ratio on family happiness is even rarer. From this perspective, this paper tried to make a preliminary answer to this question, and provide more ideas and clues for related research.

1.1. Literature Review

At the present, the empirical research on the topic of gender ratio of children in academia are quite fruitful, such as the gender-related research of children based on the measurement indicators of birth ratio, the gender of first-born child, whether there are sons, whether there are daughters, the number of sons, and the number of daughters. Song and Song(2016) explores the impact of fertility behavior-number of children, gender structure, and fertility timing and intervals on elderly women's health, and estimates the healthy survival time of elderly women by using the accelerated failure time model. They find that fertility behavior significantly influences elderly women's health. In a health perspective, more children would reduce happiness. Less number of children, appropriate age at childbearing and longer birth intervals significantly increase healthy survival time. They also further discusses the mechanisms through which fertility behavior impact elderly women's health, and points out that public policy should pay more attention to the potential impact of changing fertility behavior on women's health in the

context of implementing a two-child policy[1]. Lu et al.(2017) investigates whether and how the gender of children affects the happiness of Chinese parents. They find that the gender of the first-born has a non-trivial effect on parents' happiness. In general, sons are found to bring less happiness than daughters in all of the specifications—OLS regressions, ordered logistic regressions, IV estimations, and related robustness tests. But results vary with children's age. Parents' happiness is not affected when children are young or when they are in primary and middle schools (0-16 years old)[2].

Research on the impact of the gender ratio of children on the happiness of parents has also achieved certain results. For example, Fei Xiaotong(2012) pointed out that in traditional society, boys tend to bring more happiness to their parents than girls[3]. Other scholars explored the economic and social roots of the "patriarchy of men over women" in traditional Chinese society. It is believed that this was because the differential pattern in traditional rural society made the family network play a pivotal role in economic and social life, and the stability of the traditional family network; reproduction and prosperity were often more closely related to male members (Hou,2008[4]; Qian,2013[5]). But in modern Chinese society, with the advancement of market-oriented reforms, giving birth to girls has a significant effect on improving the happiness of parents[6]. Chen (2015) regarded children as durable consumer goods that can bring utility to their parents and pointed out that global marketization would weaken the economic function of the family, while the emotional function would be more important which meant children will gradually shift from investment goods to durable consumer goods[7].

In addition, happiness generally refers to people's subjective evaluation of current life satisfaction. It is the affirmative attitude and positive feelings generated by individuals by comparing their actual life state and ideal life state. It has the characteristics of subjectivity, enthusiasm and comprehensiveness (Diener, 2000[8]). In the 21st century, happiness has increasingly become one of the research hotspots in the fields of sociology, psychology, and economics. With the development of our country's economy and the people's pursuit of a better life, happiness has become the ruling philosophy and direction of the party and the government.

For China, which has come from a traditional family-oriented society, family happiness has always been a common pursuit of Chinese people. The improvement of family happiness is of far-reaching significance to promoting social harmony and stability and building a beautiful China. Therefore, studying family happiness is of great significance. Although the domestic academic circles have not clearly defined the concept of family happiness, some scholars have carried out a long-term follow-up study on it and found that most families feel

happy. And from the perspectives of economic factors (Xu, 2012[9]), family housing (Yang, 2015[10]) and relative occupational status of husband and wife, the multi-level influence mechanism of family happiness is investigated.

In addition, due to the continuous changes in China's fertility policy in recent years, academic circles have begun to study the relationship between reproductive behavior and family happiness. The study of Wang et al.(2013) used the data of the National Comprehensive Social Survey (CGSS2008) conducted from October to December 2008 to conduct a multiple regression analysis and found that the happiness of post-80s residents is related to the number of siblings. Based on data from the 2010 China Family Tracking Survey (CFPS2010), Mu and Xie(2014[11]) used the method of instrumental variables to find that under the specific conditions that China implements a very strict one-child policy, non-policy childbearing behaviors will bring higher levels of family Subjective well-being[12]. However, a large number of relevant studies in western developed countries show that the effect of reproductive behavior on happiness is insignificant or negative (Andrew et al., 2008[13]; Zimmermann and Easterlin[14]). Wang (2015[15]) used bivariate analysis and multiple regression analysis based on the data of the former National Population and Family Planning Commission to organize the national migrant population dynamic monitoring survey data in the second half of 2010. He also pointed out that the number of children has a nonlinear effect on happiness. The increase in happiness is not necessarily related, and the gender order and gender structure of children will also have an impact on it.

1.2. Our Contribution

At present, the research on family happiness mainly has the following problems: First, compared with foreign countries, the research on happiness in our country is still in its infancy. It focuses on the influencing factors of happiness, and rarely involves the measurement of happiness. Second, in the existing measurement research on family well-being, there is a lot of room for improvement in the measurement indicators. This makes the design of many measurement methods have defects or lack of scientificity, and it is difficult to obtain highly valid measurement results. Third, from the perspective of data collection on the basis of measurement, at present, nationally representative probability sample data in China are still relatively scarce, especially national samples specifically targeting family happiness (Wang and Wang, 2013[16]). Fourth, research on the impact of reproductive behavior on happiness is often focused on the number of children and ignores the gender factor of

children. In view of this, this paper will make up for this loophole by empirically analyzing the happiness of parents with different gender of children in different families. In the meantime, it is hopeful to help solving the imbalance of the birth ratio and changing people's stereotypes about giving birth to boys and girls.

2. RESEARCH METHODS

2.1. Model setting and variable description

This paper aims to explore the impact of children's gender on family happiness, using quantitative regression methods to conduct empirical research on this impact. The benchmark model is set as follows:

$$Y = \alpha + X\beta + \gamma Z + \varepsilon$$

Among them, Y is the independent variable, that is, family happiness; α is the intercept term, X is the core explanatory variable. The core explanatory variable in this paper is the gender of the family child; β is the regression coefficient of the core explanatory variable, on which the quantitative study in this paper mainly focuses. Z is a series of control variables, including variables those generally have been regarded as ones that can exert influence on household happiness, such as income and age of parents, education received by parents and family size; γ is the regression coefficient of the control variables; ε is the random error term. This paper assumes that it is a standard normal distribution.

2.2. Variable description and data source

The independent variable Y in this paper is family happiness. Referring to the common practice in academia, this paper uses the minimum monthly household expenditure on non-essential items as a proxy variable for household happiness. The core explanatory variable is the gender of the family's children, and the variable is denoted as G. If the gender of the children of the family is male, the G is 2. If the gender of the children of the family is female, the G is 1, and if the family has no children, the G is 0. The control variables in this paper include: family size, total family income, father's education level (including father's highest education and length of education), mother's education level (including mother's highest education and length of education), father's health level, mother's health level, father's age, mother's age, father's age and mother's age standard deviation, respectively, denoted as size, income, edudad (father's highest education), edutdad (father's education years), healthdad, agedad, edumom (mother's highest education), edutmom (Mother's years of education), healthmom, agemom, agedadsq, agemomsq. Table 1 shows the descriptive statistics of these variables.

Table 1 Descriptive Statistics of Variables

VARIABLES	Number of Observation	Mean	Standard Deviation	Minimum	Maximum
healthdad	4,906	2.157	0.730	1	5
income	3,727	27.71	350.7	0	10,250
size	3,727	3.305	0.773	2	3
G	3,727	1.444	0.497	0	2
edudad	4,986	5.424	1.642	1	9
edutdad	4,956	11.09	3.555	0	35
agedad	4,999	50.71	12.84	19.09	92.11
edumom	4,448	5.260	1.611	1	9
edutmom	4,404	10.84	3.449	0	31
healthmom	4,447	2.414	0.766	1	5
agemom	4,465	49.11	12.33	22.11	90.10
y	5,000	397.7	537.1	0	14,570
agedadsq	4,999	2,737	1,369	364.5	8,485
agemomsq	4,465	2,564	1,269	488.9	8,118

Note: The data sources of the above variables are all from the Chinese Household Income Survey

The data used in this paper is from China Household Income Projects, which is known as CHIP in the international academia, collected the income and expenditure information of China in 1998, 1995, 2002, 2007 and 2013, as well as other household and personal information, it is known as the most authoritative basic data in the field of income distribution and labour market research in China so far. This includes all provinces in China, divided into two parts: rural and urban areas. Every year, there are about 6800 households in cities and towns, with about 20000 people. There are about 9200 households in rural areas every year, and the number is about 38000.

The variables are: (1) variables at the individual level. Gender, age, years of education, industry, ownership, occupation, employment status, salary, total income, working hours, years of working, whether a member of the Communist Party of China, whether a soldier, whether a cadre, how much to spend on smoking, how much to spend on drinking, whether disabled, how much to spend on medicine, time to get sick, time to do housework, etc. Time to take care of other patients in the family, total wage, pension, stock bonus, working days, working hours, channels to find a job, living conditions, year of starting non-agricultural employment. (2) Family level variables. Total family income, family population, living area, house ownership, number of loans, ways of borrowing money, family composition of oneself, spouse and parents, family income, pension for the elderly, cash expenditure, family consumption and family property.

This paper is based on the income and expenditure information of 2013. These surveys are part of the "China Income and Inequality Research" jointly organized by Chinese and foreign researchers and completed with the assistance of the National Bureau of Statistics, so they are extremely reliable.

3. REGRESSION METHOD

The data used in this paper are cross-sectional data, so the least squares method (OLS) and maximum likelihood estimation (MLE) are used for regression analysis. The least squares method is a type of parameter estimation method that estimates unknown parameters

based on the minimum sum of the residual squares of sample observations and estimated values. The least squares method has loose requirements for the overall distribution and sample size, and does not require knowing the specific form of the overall distribution. The least square method can be applied to small sample data, and it also has good estimation properties under small sample conditions. What satisfies the classical assumption is the best linear unbiased estimator. The maximum likelihood method is based on the principle of maximum likelihood. It believes that after randomly extracting n sets of sample observations, the most reasonable parameter estimator should be the estimator that maximizes the probability of extracting these n sets of sample observations. The maximum likelihood estimation method generally only includes the maximum likelihood estimation method (ML), which can fully reflect the maximum likelihood idea. The premise of using the maximum likelihood distribution is that the specific distribution of the overall variable is known, and the general assumption is that it obeys the normal distribution. If the hypothesis is true, the maximum likelihood estimator is more effective than the least squares estimator.

4. ANALYSIS OF REGRESSION RESULTS

Table 2 shows the estimated results of the least square regression and the maximum likelihood regression.

	OLS	MLE
G	-35.806* (20.606)	-35.806* (20.562)
size	76.864*** (15.278)	76.864*** (15.246)
income	0.034 (0.0003)	0.034 (0.0003)
edadad	24.224* (13.903)	24.224* (13.873)
edutdad	3.128 (6.561)	3.128 (6.547)
healthdad	11.727 (17.836)	11.727 (17.798)
agedad	25.389** (12.562)	25.389** (12.536)
agedadsq	-0.219* (0.125)	-0.219* (0.125)
edumom	46.603*** (14.590)	46.603*** (14.559)
edutmom	-0.608 (6.800)	-0.608 (6.786)
healthmom	43.722*** (16.497)	43.722*** (16.462)
agemom	-9.262 (12.273)	-9.262 (12.247)
agemomsq	0.067 (0.127)	0.067 (0.126)
Constant	-506.824** (224.038)	-506.824** (223.561)
Number of Observation	3288	3288
R ²	0.840	0.838

Note: *p<0.1 **p<0.5 ***p<0.01. The standard deviation is in parentheses.

In the regression of this paper, the explanatory variable is the minimum monthly household expenditure on non-essential items, which we believe can represent family happiness. It can be seen from the table 2 that whether it is OLS model regression or MLE model regression, the coefficient of the core explanatory variable is -35.806, and it is significant at the 90 percent level. This shows that the gender of the children has a significant impact on the family's monthly minimum expenditure on non-essential consumer goods. The negative sign indicates that the gender ratio of the family's children is negatively correlated with family happiness, which means boys bring less happiness to household than girls and this result is also consistent with the results of other studies. One of the reasonable cause is that, in China, parents have to provide money for boys

to get married and buy an apartment, while it is not required for parents giving birth to girls. As a result, Chinese families with boys will save more and spend less.

In terms of other control variable, the family size has a significant impact on the family's monthly minimum non-essential consumer spending. Whether in OLS or MLE regression, the regression coefficient is 76.864, and it is significant at the 99% level. It quite makes sense that more members the family has, more total expenditure it will spend. The father's educational background and age has a significant impact on the family's monthly minimum non-essential consumer spending. Whether in OLS or MLE regression, the regression coefficients are 24.224 and 25.389 respectively, and they are significant

at the 90 and 95 percent level. This shows that the improvement of father's education level can bring family happiness. As fathers get old, their earnings will increase, so they can support more spending of the household. The mother's educational background and health level has a significant impact on the family's monthly minimum non-essential consumer spending. Whether in OLS or MLE regression, the regression coefficients are 46.603 and 43.722 respectively, and they both are significant at the 99 percent level. This shows that the improvement of mother's education level and health can bring family happiness.

5. CONCLUSION AND DISCUSSION

The data results show that the gender ratio of family children has a more significant impact on family happiness. The higher the family child sex ratio, the lower the family happiness, which is consistent with the results of other related studies. In addition, the father's education and age, mother's education and health has a significant impact on family happiness. The improvement of father's education level and age, mother's education level and health can bring family happiness.

Daughter would bring more happiness than sons would in a family. As we know in China, parents have to buy a marriage house for them before marriage. Chinese traditional concept of raising children for old age has gone bankrupt. Now the social security system is gradually improving, and parents can live on pension or social security when they are old. Nowadays young people are generally reluctant to live with their parents after marriage, which makes daughters do no less than sons in taking care of their parents and tend to pay more love.[17, 18, 19, 20, 21]

At the same time, it should be pointed out that there are still some limitations in the research of this paper. Due to the limitations of the survey data based on this study, it is impossible to accurately investigate the effects of some variables. For example, the data in this paper comes from the 2013 survey on the income of Chinese urban, rural and floating population residents. It has been 8 years since then. During this period, many changes have taken place in Chinese society. Family happiness is especially young people's family happiness. Sense may have changed. In short, this paper is only a preliminary discussion on the impact of the gender ratio of family children on family happiness.

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