

# Does Late Marriage and Late Childbearing Affect Happiness? — — Based on Chinese General Social Survey

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**Abstract:** In an era of strict family planning policies in China, a popular propaganda slogan is "late marriage and late childbearing, fewer and better births, then happy life." This article investigates whether late marriage and late childbearing make people happier. The empirical results from the Chinese General Social Survey show that the first childbearing age has a significant negative impact on happiness, whereas the age at first marriage has no effect on happiness. The impact of marriage on happiness is through the birth of children. Further, young people have a greater negative impact than elderly people; men have a greater negative impact than women; and rural residents have a greater negative impact than urban residents. Mechanism analysis reveals three main channels through which the age at first childbearing affects happiness: first, postponing the first childbearing age will increase labor income, thereby reducing happiness (testing revealed that an increase in labor income will lead to a decrease in leisure time); second, postponing the first childbearing age will reduce the number of children born, thereby reducing happiness; third, postponing the first childbearing age reduces the likelihood of having grandchildren for people of the same age, lowering happiness.

**Keywords:** first marriage age; first childbearing age; happiness; childbearing; number of children

## 1. Introduction

The phenomenon of late marriage and late childbearing has become more common as economic society has advanced. According to the China Marriage Report 2021, between 2005 and 2019, the proportion of registered marriages fell from 47% to 19.7% for those aged 20-24 (including remarriage), from 34.3% to 34.6% for those aged 25-29, and from 9.9%, 4.9%, 3.9% to 17.7%, 8.1%, and 19.9% for those aged 30-34, 35-39, and over 40. In 2019, the proportion of marriages between people over the age of 30 increased to 45.7%. According to the China Population and Employment Statistics Yearbook, the average first childbearing age for women born between 1990 and 2019 increased from 24.1 to 26.4 years, while the average childbearing

age increased from 24.8 to 28.1 years. Even if there is no policy limiting the number of births during a limited period of childbearing, the late first childbearing age reduces the willingness to have children again, lowering the total fertility rate (Marini & Hodsdon, 1981; Philip Morgan & Rindfuss, 1999). As a result, the population will inevitably age faster, and the population will be smaller.

Since China implemented the family planning policy in 1980s, the main content and slogan of family planning has been "late marriage and late childbearing, fewer and better children." To increase public awareness, the slogan has even been changed to "late marriage and late childbearing, fewer and better children, then happy life." Late marriage and late childbearing are more likely to have "fewer children" than early marriage and early childbearing. Families with fewer children will have more resources to invest in their children's education, and "fewer children" will lead to "eugenics." This logical line has gained common acceptance. While, "late marriage and late childbearing, fewer and better children" really promote a "happy life"?

There is a growing body of research on the impact of "fewer and better children" on happiness. Leibenstein (1975) discussed the utility of fertility behavior from the standpoint of utility theory as early as the 1970s. According to the literature, multi-child families will benefit from higher income and pension security for their parents (Leibenstein, 1975; Hansen, 2012; Vanassche et al., 2013). Parents can see the continuation of their own lives in the development of their children (Eibach & Mock, 2011; Nelson et al., 2013). However, some studies have discovered that the problems associated with childbirth, such as the mother's career planning, the economic cost of raising children, and the reduction of parents' own leisure time, reduce parents' happiness (Bittman & Wajcman, 2000; Dommermuth & Kitterød, 2009; Dørheim et al., 2009; Aassve et al., 2012;). Other studies analyze the impact of childbearing on parental happiness from gender heterogeneity ((Goldscheider et al., 2015; Jalovaara et al., 2019). While "eugenics" will undoubtedly improve the happiness of parents in both ancient and modern times.

Many studies on the impact of marriage age and first childbearing age on happiness have found that married people are happier than single people because married people are healthier and wealthier than unmarried people (Gove et al., 1983; Hao, 1996; Johnson et al., 2017; Musick & Bumpass, 2012; Stack & Eshleman, 1998; Tao, 2019). The research on marriage age focused primarily on early marriage (men under 22 years old and women under 20 years old in China). According to the findings, early marriage reduces people's education time, employment opportunities, the possibility of family financial difficulties, and happiness (Umberson et al., 2010). However, studies on the impact of marriage and childbearing age on happiness are scarce in China. Based on this, we will investigate the impact of marriage age and first childbearing age on happiness using the Chinese General Social Survey, and whether "late marriage and late childbearing" is a "happy life."

## **2. Method**

### **2.1 Data and Variable**

The sample for this paper's benchmark regression is micro data from the Chinese General Social Survey (CGSS2017). The database shows whether people are happy directly, and the marriage age shows the first childbearing age indirectly. The most commonly used method for measuring happiness is self-report, in which respondents' grade options in relevant questions

are used to calculate individual subjective happiness. The measurement method is simple and straightforward, capable of meeting physiological measurement requirements, and has some reliability and validity (Veenhoven, 1996). "In general, do you think your life is happy?" asks the CGSS questionnaire. This question can be used to determine whether or not people are happy. When did you first marry? This question is used to determine the respondents' marriage age (first marriage age).

The questionnaire, however, did not directly ask about the first childbearing age. We find the respondent's oldest son or daughter among family members (including all family members who live together and temporarily elsewhere). The value obtained by subtracting the respondent's age from the age of his oldest son or daughter is considered the respondent's first childbearing age. Because the eldest son or daughter may not be included in the family members due to separation, this calculation may differ from the actual first childbearing age. The questionnaire asks respondents directly how many children they have. Because of the different number of family members, each piece of information must be compared when screening the eldest son or daughter, allowing us to see if respondents include their children as family members. We can see that almost all of the respondents include their children as family members, with only a few daughters left out; such a small number of samples must be discarded. Furthermore, this calculation excludes non-biological children (adoption, stepson), as well as the death of the eldest son or daughter prior to the survey time, but these are extremely rare in practice and can be ignored in a large sample.

As control variables, we choose some related variables that influence people's happiness. Total revenue; labor income; housing area; and the number of estates comprise family income. Work: whether he is the boss; a self-employed household; a state-owned or state-controlled enterprise; the number of years worked. Demographic characteristics include registered residence; ethnic; gender; age; number of children; highest education of individual; highest education of spouse; own health status. In addition to selecting the relative variable of family economic status in the location in comparison to others. Given that people born before 1946 are over the age of 80, this segment of the population is excluded. We investigated the impact of marriage and childbearing ages on happiness. The study excluded unmarried and infertile people. Table 1 displays the meaning, assignment, and descriptive statistics for each variable. The education is assigned using the CGSS questionnaire's highest education assignment standard, and the annual total income and annual labor income are logarithmically processed. Excluding the missing answers to some questions, the sample observation value available is 4448.

Table 1 Variable descriptive statistics

Variable	Abbreviation	Definition	Average	Standard Deviation	Minimum	Maximum
Happiness	/	Very unhappy =-2; less happy =-1; not happy nor unhappy = 0; happier = 1; very happy = 2	0.870	0.794	-2	2
First marriage age	Marry	/	25.34	13.86	14	44
First childbearing age	Bearing	/	27.03	4.420	15	45
Total Revenue	Income	Logarithm of RMB	8.364	3.655	0	16.12
Labor income	Labor	Logarithm of RMB	7.141	4.491	0	15.42
Housing area	Area	Square meters	125.3	100.1	5	2400
Family economic	Level	Far below average =-2;	2.651	0.705	1	5

level		lower than average =-1; average = 0; higher than average = 1; much higher = 2				
Number of estates	Number	/	1.132	0.604	0	14
Education	Edu	Years	7.718	3.731	1	18
Spouse's education	Edu	Years	7.821	3.701	1	18
health status	Health	Very unhealthy =-2; less healthy =-1; generally = 0, healthy= 1; very healthy = 2	0.634	1.065	-2	2
Number of children	Child	/	1.809	1.026	1	9
Pension attitude	Pension	Others = 0; government / children / elderly responsibility sharing = 1; mainly children responsible = 2	1.377	0.725	0	2
Number of years worked	Workyear	/	6.995	10.67	0	52
Registered residence	Hukou	Agricultural = 0; Non- Agricultural =1	0.325	0.468	0	1
Ethnic	/	Han = 0; ethnic minorities = 1	0.093	0.290	0	1
Gender	/	Female = 0; male = 1	0.462	0.498	0	1
Year of birth	Age	/	1968	13.30	1947	1995
Boss	/	Others = 0; the boss = 1	0.021	0.142	0	1
Self-employed households	Individual	Others = 0; self-employed household = 1	0.089	0.286	0	1
State-owned Enterprise	Soe	Others = 0; in state-owned or state-owned holding enterprises = 1	0.101	0.302	0	1

The mean value of the explained variable happiness in Table 1 is 0.87, indicating that people's lives are generally happy. The standard deviation is 0.79, with a minimum value of -2 and a maximum value of 2, indicating that both happy and unhappy people have. The average age at first marriage was 25.34, with a standard deviation of 13.86. The average first childbearing age is 27.03 years old, with a standard deviation of 4.42, slightly higher than the 26.4 years old in the sampling survey of China's population and Employment Statistical Yearbook in 2019. Both the explained variable and its value are highly variable, which allows the econometric model to estimate the impact of the explained variable on the explained variable.

## 2.2 Benchmark Model

We use the ordinary least squares (OLS) method for regression estimation based on the numerical characteristics of the explained variables and the explained variables.

$$happy_i = \beta_0 + \beta_1 marry_i + \beta_2 bearing_i + \Phi X_i + \mu_i \quad (1)$$

where  $happy_i$  represents happiness,  $marry_i$  and  $bearing_i$  represent first marriage age and first childbearing age respectively.  $X_i$  is the vector containing all control variables.  $\beta_0$  is the intercept term.  $\beta_1$  and  $\beta_2$  represent the estimation coefficient of first marriage age and first childbearing age respectively.  $\Phi$  is the vector containing the estimation coefficients of all control variables.  $\mu_i$  is a random error term. In order to reduce the multiple collinearities in equation (1), we have carried out econometric regression on equation (2) and equation (3) respectively in the benchmark regression.

$$happy_i = \beta_{01} + \beta_{11} marry_i + \Phi_1 X_i + \mu_i \quad (2)$$

$$happy_i = \beta_{02} + \beta_{22} bearing_i + \Phi_2 X_i + \mu_i \quad (3)$$

### 3. Regression results

#### 3.1 Benchmark regression results

The model is estimated using the heteroscedasticity robust standard error method, and the results are shown in Table 2. Column (1) only contains the regression results for the first marriage age and control variables. At the 10% level, the first marriage age coefficient is significantly negative, indicating that the first marriage age has a negative impact on happiness. Column (2) is an extension of column (1), substituting the marriage age for the first marriage age (including remarriage, denoted as Marry1). The findings show that marriage age has no effect on happiness, but the coefficient sign remains negative. The regression result, including the first childbearing age and control variables, is shown in column (3). The first childbearing age coefficient passed the 1% significance test, and it was negative, indicating that the first childbearing age had a significant negative impact on happiness. Column (4) contains the regression result for the first marriage age, first childbearing age, and control variables, while column (5) contains the regression result for the first marriage age, first childbearing age, and control variables. The results show that the coefficients of first marriage age and marriage age failed the significance test, but the coefficient of first childbearing age is still significant, at least at the 5% level, and the coefficient is still negative. It demonstrates that after including the first childbearing age, the first marriage age loses significance, indicating that the first marriage age's impact on happiness is likely to be replaced by the first childbearing age.

Table 2 Benchmark regression results

Explanatory variable	(1)	(2)	(3)	(4)	(5)
Marry	-0.0064* (0.0034)			0.0008 (0.0040)	
Marry1		-0.0001 (0.0001)			0.0000 (0.0001)
Bearing			-0.0084*** (0.0029)	-0.0088** (0.0036)	-0.0079*** (0.0029)
Income	0.0405* (0.0213)	0.0414* (0.0213)	0.0390* (0.0213)	0.0389* (0.0213)	0.0400* (0.0214)
Labor	-0.0352* (0.0180)	-0.0336* (0.0181)	-0.0332* (0.0180)	-0.0331* (0.0180)	-0.0320* (0.0181)
Area	0.0003*** (0.0001)	0.0003*** (0.0001)	0.0003*** (0.0001)	0.0003*** (0.0001)	0.0003*** (0.0001)
Level	0.1007*** (0.0201)	0.1012*** (0.0201)	0.0998*** (0.0200)	0.0999*** (0.0200)	0.0994*** (0.0200)
Number	0.1020*** (0.0214)	0.1031*** (0.0215)	0.1013*** (0.0214)	0.1013*** (0.0214)	0.1017*** (0.0216)
Edu	0.0077* (0.0047)	0.0063 (0.0046)	0.0083* (0.0047)	0.0082* (0.0047)	0.0075 (0.0047)
Edup	0.0154*** (0.0046)	0.0151*** (0.0046)	0.0156*** (0.0046)	0.0155*** (0.0046)	0.0159*** (0.0046)
Health	0.1667*** (0.0131)	0.1668*** (0.0131)	0.1674*** (0.0130)	0.1673*** (0.0130)	0.1680*** (0.0131)
Child	0.0265* (0.0148)	0.0312** (0.0147)	0.0273* (0.0146)	0.0278* (0.0149)	0.0282* (0.0147)
Pension	0.0480*** (0.0166)	0.0460*** (0.0166)	0.0483*** (0.0166)	0.0484*** (0.0166)	0.0459*** (0.0166)
Hukou	0.0219 (0.0290)	0.0192 (0.0290)	0.0237 (0.0290)	0.0236 (0.0290)	0.0215 (0.0291)
Ethnic	-0.0269 (0.0391)	-0.0243 (0.0388)	-0.0248 (0.0391)	-0.0248 (0.0391)	-0.0214 (0.0389)
Gender	-0.0019 (0.0251)	-0.0082 (0.0247)	0.0030 (0.0250)	0.0023 (0.0252)	0.0028 (0.0251)
Age	-0.0005	-0.0050***	-0.0062***	-0.0070*	-0.0061***

	(0.0034)	(0.0012)	(0.0013)	(0.0042)	(0.0013)
Workyear	-0.0026**	-0.0026**	-0.0027**	-0.0027**	-0.0026**
	(0.0013)	(0.0013)	(0.0013)	(0.0013)	(0.0013)
Boss	-0.0096	-0.0142	-0.0069	-0.0070	-0.0093
	(0.0714)	(0.0725)	(0.0711)	(0.0711)	(0.0725)
Individual	0.0243	0.0237	0.0237	0.0238	0.0225
	(0.0381)	(0.0385)	(0.0381)	(0.0381)	(0.0384)
Soe	-0.0030	-0.0024	-0.0013	-0.0014	-0.0002
	(0.0397)	(0.0398)	(0.0397)	(0.0397)	(0.0398)
Constant	10.8012***	9.9900***	12.4623***	12.4476***	12.2397***
	(2.4081)	(2.3732)	(2.4833)	(2.4841)	(2.4895)
Observations	4,448	4,448	4,448	4,448	4,448
R-squared	0.1064	0.1059	0.1078	0.1078	0.1075

Note: \*\*\*, \*\*, \* indicated in 1%, 5%, 10% statistical level is significant, parentheses for the standard error, the same below.

The coefficients of total revenue and labor income in the control variables passed the 10% significant level test. The first symbol is positive, while the second is negative, indicating that total revenue has a positive impact on happiness while labor income has a negative impact. It demonstrates that people choose to forego their leisure time in order to increase their labor income, thereby decreasing their happiness ((Easterlin, 2001; Knabe & Rätzel, 2010). The housing area, family economic level, and number of estates coefficients all passed the 1% significant level test. The symbols are all positive, indicating that these three have impact on happiness. It reflects people's desire for a better and more comfortable life. In columns (1), (3), and (4), the education coefficient only passed the 10% significance level test (4). The spouse education coefficient is highly significant, with both symbols being positive. It demonstrates that people with a high level of education have a deeper understanding of the world, which will have an imperceptible effect on each other and increase the happiness of both parties. Their own health status coefficient is significantly positive, indicating that happier groups are healthier. The number of children coefficient is significantly positive, confirming the proverb "more children, more happiness." The pension attitude coefficient is significantly positive, indicating that people who place a higher value on family are happier. Years of birth and employment have a significant negative impact on happiness. Hukou, ethnic, gender, Boss, or Soe have no effect on happiness. In general, the symbols of the estimated coefficients of these control variables roughly correspond to expectations.

### 3.2 Robustness test

#### 3.2.1 Replace the estimation method

The explained variable happiness is a ranked hierarchical variable with only 5 change values. Simplify happiness assignment by setting the values of comparative and very happiness to 1 and the others to 0. Happiness is reduced to a 0-1 binary variable. To regress the explanatory and explained variables, we use the logit and probit models, respectively. The outcomes are shown in Tables 3 and 4.

Table 3 Regression results by logit model

Explanatory variable	(1)	(2)	(3)	(4)	(5)
Marry	-0.0151 (0.0116)			0.0042 (0.0136)	
Marry1		-0.0225*** (0.0086)			-0.0140 (0.0098)
Bearing			-0.0278*** (0.0098)	-0.0297** (0.0115)	-0.0196** (0.0101)
Control variables	Yes	Yes	Yes	Yes	Yes
Constant	22.6208**	24.2249***	28.4157***	28.3169***	28.4152***

	(8.9460)	(8.9741)	(9.2645)	(9.2612)	(9.3220)
Observations	4,448	4,448	4,448	4,448	4,448
R-squared	0.0834	0.0845	0.0849	0.0849	0.0853

Table 4 Regression results by probit model

Explanatory variable	(1)	(2)	(3)	(4)	(5)
Marry	-0.0092 (0.0066)			-0.0015 (0.0079)	
Marry1		-0.0128*** (0.005)			-0.008 (0.0057)
Bearing			-0.0157*** (0.0056)	-0.0164** (0.0067)	-0.0111** (0.0056)
Control variables	Yes	Yes	Yes	Yes	Yes
Constant	13.1582*** (5.0359)	13.9434*** (5.0479)	16.2383*** (5.2026)	16.1991*** (5.2018)	16.2765*** (5.2328)
Observations	4,448	4,448	4,448	4,448	4,448
R-squared	0.0837	0.0846	0.0851	0.0851	0.0854

In Table 3 and table 4, the coefficient significance of logit model and probit model are the same, just the values are different. Compared with the benchmark regression results, the first marriage age coefficient in columns (1) and (2) did not pass the significance level test, while the sign of the marriage age coefficient under the 1% level was still consistent with the benchmark regression results. When the first childbearing age is added, the marriage age coefficient does not pass the significance level test. This shows that under the regression of binary variables, the influence of marriage age on happiness is affected by the first childbearing age.

### 3.2.2 Change the sample

Now we Change CGSS2017 data to CGSS2015 data. The CGSS questionnaire is not a follow-up questionnaire. The data are inconsistent because the corresponding samples in different years differ. The survey contents of the two questionnaires are nearly identical, as are the corresponding questions, explained variables, explanatory variables, and control variables. Similarly, the samples are people under the age of 80 who have a child. The total number of samples in CGSS2015 is 4606, which is slightly higher than the total number of samples in CGSS2017.

Table 5 Robustness test of using CGSS2015 data

Explanatory variable	(1)	(2)	(3)	(4)	(5)
Marry	-0.0098*** (0.0036)			-0.0057 (0.0040)	
Marry1		-0.0001 (0.0001)			-0.0001 (0.0001)
Bearing			-0.0089*** (0.0029)	-0.0061** (0.0031)	-0.0087*** (0.0029)
Control variables	Yes	Yes	Yes	Yes	Yes
Constant	14.6394*** (3.3830)	12.8805*** (3.3342)	16.2752*** (3.5376)	16.3070*** (3.5377)	16.4032*** (3.5375)
Observations	4,606	4,606	4,606	4,606	4,606
R-squared	0.1054	0.1041	0.1057	0.1061	0.1061

Table 5 displays the regression results. The regression results obtained with CGSS2015 data are nearly identical to the benchmark regression results. The first marriage age coefficient is significantly negative at the 1% level only in column (1) regression. Other regression columns,

with the exception of slightly different coefficient values, have coefficient symbols and explanatory variable significance that are consistent with the results of benchmark regression.

The robustness test demonstrates that changing the estimation method and changing samples have no effect on the basic conclusion of the benchmark regression results. That is: the first marriage age (or marriage age) has no effect on happiness, whereas the first childbearing age has a significant negative effect on happiness, indicating that delaying the first childbearing age reduces happiness. Therefore, the benchmark regression results are generally robust.

### 3.3 Heterogeneity analysis

The reproductive behavior is distinctive. The reproductive and parenting cycle is lengthy, while men and women have different reproductive behaviors. We divide the samples by age and gender based on the two fertility characteristics. Furthermore, there may be differences in reproductive behavior and concepts between urban and rural Chinese residents. As a result, we investigate the effect of first marriage age and first childbearing age on happiness from the standpoints of age, gender, and urban and rural areas.

#### 3.3.1 Heterogeneity analysis by age group

We divided the population studied into two groups: elderly people and young people. The age groups are divided into two kinds groups: one is over 45 (elderly people) and others (young people) while the other is over 50 (elderly people) and others (young people), respectively. Table 6 shows the regression results. The first marriage age and marriage age have no significant impact on any age group's happiness, whereas the first childbearing age has a significant negative impact on any age group's happiness. The absolute value of the coefficient of the first childbearing age is greater than the absolute value of the coefficient of more than 45 years, and the absolute value of the coefficient of less than 50 years is greater than that of more than 50 years. It demonstrates that, when compared to the elderly populations, first childbearing age has a greater negative impact on young people's happiness.

Table 6 Regression by age group

Explanatory variable	(1) More than 45	(2) More than 45	(3) Less than 45	(4) Less than 45	(5) More than 50	(6) More than 50	(7) Less than 45	(8) Less than 45
Marry	-0.0009 (0.0048)		0.0057 (0.0072)		-0.0013 (0.0053)		0.0062 (0.0061)	
Marry1		0.0001 (0.0001)		0.0006 (0.0053)		0.0001 (0.0001)		-0.0017 (0.0049)
Bearing	-0.0072* (0.0041)	-0.0073** (0.0036)	-0.0166** (0.0068)	-0.0152** (0.0062)	-0.0084* (0.0046)	-0.0087** (0.0040)	-0.0140** (0.0056)	-0.0110* (0.0057)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	30.1595*** (4.7033)	29.6496*** (4.7090)	9.7156 (6.2561)	9.6350 (6.2675)	32.1541*** (5.4283)	31.6453*** (5.4420)	5.1145 (5.2550)	4.6111 (5.2382)
Observations	2,493	2,493	1,955	1,955	2,026	2,026	2,422	2,422
R-squared	0.1411	0.1405	0.0864	0.0857	0.1461	0.1447	0.0954	0.0951

#### 3.3.2 Heterogeneity analysis by gender

Table 7 shows the gender-specific regression results. The coefficients of first marriage age and marriage age failed the significance test, but the coefficient of first childbearing age passed at the 10% level. The first marriage age (or marriage age) has no effect on men and women's happiness, whereas the first childbearing age has a significant negative effect on men and women's happiness. The absolute value of the first childbearing age coefficient of men is greater than that of women, indicating that the negative effect of increasing the first childbearing age



on men's happiness is greater than that of women. As a result, men are more willing to have children at a young age.

Table 7 Regression by gender

Explanatory variable	(1)	(2)	(3)	(4)
	Male	Female	Male	Female
Marry	-0.0002 (0.0054)	-0.0030 (0.0060)		
Marry1			-0.0001 (0.0001)	-0.0000 (0.0001)
Bearing	-0.0104** (0.0047)	-0.0081* (0.0041)	-0.0105** (0.0049)	-0.0072* (0.0038)
Control variables	Yes	Yes	Yes	Yes
Constant	9.8073*** (3.6575)	14.7869*** (3.4534)	9.8654*** (3.6592)	14.3860*** (3.4650)
Observations	2,055	2,393	2,055	2,393
R-squared	0.1375	0.0963	0.1365	0.0963

### 3.3.3 Heterogeneity analysis between urban and rural areas

According to agricultural and non-agricultural registered permanent residence, the investigated population is divided into urban residents and rural residents, with agricultural residence registration outnumbering non-agricultural residence registration. The regression results are shown in Table 8. The first marriage age and marriage age have no effect on happiness, whether in urban or rural areas. The impact of the first childbearing age on happiness has passed the 10% significance test, with rural residents having a greater impact. The negative impact of rural residents' first childbearing age on happiness is greater based on the absolute value of the coefficient, and the relative difference of the absolute value of the coefficient is greater than that of the gender coefficient. In short, the impact of first childbearing age on happiness differs between urban and rural areas, with rural residents more willing to have children early.

Table 8 Regression between urban-rural

Explanatory variable	(1)	(2)	(3)	(4)
	rural	urban	rural	urban
Marry	-0.0042 (0.0054)	-0.0078 (0.0062)		
Marry1			0.0001 (0.0000)	-0.0050 (0.0042)
Bearing	-0.0115*** (0.0036)	-0.0061* (0.0033)	-0.0102*** (0.0030)	-0.0058** (0.0027)
Control variables	Yes	Yes	Yes	Yes
Constant	11.3728*** (3.2981)	13.6307*** (3.8509)	11.1804*** (3.3027)	13.6231*** (3.8980)
Observations	2,595	1,853	2,595	1,853
R-squared	0.1247	0.1030	0.1234	0.1040

Therefore, the first marriage age has no significant impact on the happiness of people of different ages and genders, whereas the first childbearing age has a significant negative impact on the happiness of subpopulations, according to heterogeneity analysis. The negative impact on the young is greater than the negative impact on the elderly, the negative impact on men is greater than the negative impact on women, and the negative impact on rural residents is greater than the negative impact on urban residents.

## **4. Mechanism analysis**

### **4.1 Mechanism description**

Why is the first marriage age (or marriage age) having no effect on happiness while the first childbearing age has a significant negative effect? People who are not married and do not have children were excluded from the sample. In the married population, the first marriage age (marriage age) has an impact on whether the first childbearing age is delayed. The first marriage age and the first childbearing age have a strong positive correlation, with a correlation coefficient of 0.736. On the one hand, the impact of first marriage age on happiness is minor. On the other hand, the influence of first marriage age on happiness will be replaced by the influence of first childbearing age on happiness. Therefore, in the regression results, first marriage age has no significant effect on happiness.

But why does the first childbearing age have such an impact on happiness? First and foremost, we must consider the consequences of delaying the first childbearing age. Remove the objective factors of meeting the right object early or late and infertility taking a long time to cure, and some people may delay childbearing because they want to receive more vocational training or higher education so that they can earn more money in their future work (Blackburn & Cipriani, 2002; Hickman et al., 2018).

The first hypothesis is that delaying the age of first childbearing will increase residents' income level. The non-strict one-child policy reduces the likelihood of having another child due to women's limited childbearing period and the delay of the first childbearing age (Marini & Hodsdon, 1981; Philip et al., 1999). The second hypothesis is that delaying the age of first childbearing will result in fewer children. Delaying the first childbearing age will result in a large age gap between parents and children, and an even larger age gap with grandchildren. The third hypothesis holds that delaying the age of first childbearing reduces the likelihood of meeting grandchildren.

Then, consider how the three outcomes of delaying the first childbearing age affect their own happiness. As previously stated, an increase in income generally increases people's happiness (Easterlin, 2001). However, increasing labor income does not increase people's happiness because more labor income means less leisure time (Knabe & Rätzl, 2010). The increase in the number of children may either increase or decrease people's happiness (Dørheim et al., 2009; Vanassche et al., 2013). However, the concept and phenomenon of "more children and more happiness" are more visible in China. As a result, having more children is likely to increase happiness. Many studies have found that families with grandchildren are happier (Dunifon et al., 2020; Ku et al., 2013).

The impact of the first childbearing age on happiness can be divided into three categories. First, delaying the first childbearing age increases income, which increases happiness. Of course, delaying the first childbearing age will not improve happiness if it only increases labor income. Second, delaying the first childbearing age reduces the number of children, lowering people's happiness. Third, delaying the first childbearing age reduces the likelihood of having grandchildren at the same age, lowering people's happiness. The first path indicates that delaying the first childbearing age may increase happiness, whereas the second and third paths indicate that delaying the first childbearing age should decrease happiness. The three effects together cause the impact of the first childbearing age on happiness.

### **4.2 Intermediary effect**

Now we analyze the mediating effect of delaying the first childbearing age on happiness. The selected mediating variables are income, the number of children and having grandchildren. Based on Baron & Kenny (1986), construct mediation effect model.

$$M_i = \alpha_0 + \alpha_1 bearing_i + \alpha_2 X_i + \varepsilon_i \quad (4)$$

$$happy_i = \gamma_0 + \gamma_1 bearing_i + \gamma_2 M_i + \gamma_3 X_i + \varepsilon_i \quad (5)$$

where  $happy_i$  is happiness,  $bearing_i$  is the first childbearing age,  $M_i$  is the mediating variable, i.e., income, number of children and grandchildren.  $X_i$  is the control variable, which is consistent with that in the benchmark model. When taking income as the explanatory variable, some variables that do not affect income are excluded, such as housing area, number of estates and number of children.  $\alpha$  and  $\gamma$  are the estimated coefficients of the variable.  $\varepsilon_i$  and  $\varepsilon_i$  is the random error term.

Table 9 shows the results of step-test procedure with income, number of children and grandchildren as intermediary variables. According to the index of calculating grandchildren by family members in CGSS questionnaire, having grandchildren in the family is defined as 1, and no grandchildren is defined as 0. In the regression with grandchildren variables, only people aged 46 and over were retained. Only people aged 46 and up were included in the regression with grandchildren variables. Without any intermediary variables, the first childbearing age has a significant negative impact on happiness (Column 1). The benchmark regression shows that the first childbearing age has a significant negative impact on happiness, total revenue and the number of children have significant positive impacts on happiness, and labor income has a significant negative impact on happiness. Columns (3)-(6) show the impact of the first childbearing age on total revenue, labor income, the number of children, and grandchildren (Gchild). The first childbearing age has no effect on total revenue, but has a significant positive impact on labor income and a significant negative impact on the number of children and grandchildren. To summarize, delaying the first childbearing age increases labor income but has no effect on total revenue. Happiness will decrease as labor income rises. People who have a large number of children and grandchildren are happier. Delaying the first childbearing age decreases the number of children and the likelihood of grandchildren among peers, lowering their happiness. These three effects cause a delay in the first childbearing age, which reduces happiness.

Table 9 Intermediary effect

Explanatory variable	(1) Happy	(2) Happy	(3) Income	(4) Labor	(5) Child	(6) Gchild
Marry	0.0013 (0.0040)	0.0001 (0.0001)	0.0015 (0.0040)	-0.0066 (0.0045)	-0.0014*** (0.0001)	-0.0057** (0.0023)
Bearing	-0.0102*** (0.0036)	-0.0068* (0.0039)	0.0003 (0.0035)	0.0083** (0.0040)	-0.0160*** (0.0039)	-0.0155*** (0.0020)
Gchild		0.1016*** (0.0363)				
Income		0.0627** (0.0248)			-0.0992*** (0.0285)	-0.0169 (0.0144)
Labor		-0.0155* (0.0088)			0.0367 (0.0229)	-0.0054 (0.0119)
Child		0.0251* (0.0135)				0.0237** (0.0099)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Constant	12.9734*** (2.2303)	20.4030*** (4.5150)	11.6903*** (2.4194)	-28.5276*** (2.8252)	59.1435*** (2.9783)	45.9428*** (2.2306)
Observations	4,448	2,493	4,448	4,448	4,448	2,493

R-squared	0.1012	0.1344	0.1698	0.2551	0.3110	0.2590
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It is worth noting that the first childbearing age has a positive impact on labor income, while labor income has a negative impact on happiness. The former is easy to understand. Let's verify that the increase of labor income reduces leisure time, so as to reduce people's happiness. In the CGSS questionnaire, there is a question related to people's leisure time, that is, "have you often done the following things in your free time in the past year?". The options are: "1. Socialize / visit; 2. Rest and relax; 3. Learn to recharge". These three options include almost all periods of people's leisure time. Each option is divided into five levels. "Never - 1; rarely - 2; sometimes - 3; often - 4; very often - 5". Assuming that the three options have the same importance, add the levels of the three options to construct the variable leisure, and the value changes from 1 to 15. The larger the value, the more leisure time a person has. Next, whether the increase of labor income will reduce leisure time and whether leisure has a positive impact on happiness?

Table 10 Test of leisure effect

Explanatory variable	(1) Leisure	(2) Leisure	(3) Leisure	(4) Happy	(5) Happy
Income	0.1185** (0.0520)	-0.0273 (0.0578)	-0.1684** (0.0755)	0.0391* (0.0212)	0.0404* (0.0215)
Labor	-0.0736* (0.0400)	-0.1424*** (0.0479)		-0.0295* (0.0168)	-0.0286* (0.0161)
Bearing		-0.0019 (0.0072)	-0.0033* (0.0019)	-0.0088** (0.0036)	-0.0078*** (0.0029)
Leisure				0.0280*** (0.0062)	0.0281*** (0.0063)
Marry					0.0367 (0.0229)
Marry1				0.0007 (0.0040)	0.0000 (0.0001)
Control variables	No	Yes	Yes	Yes	Yes
Constant	7.8425*** (0.0811)	7.3616 (6.1617)	14.9001** (6.3800)	12.1434*** (2.8031)	11.9199*** (2.828)
Observations	4,448	4,448	4,448	4,448	4,448
R-squared	0.0312	0.1252	0.1216	0.1131	0.1123

Table 10 shows the regression results with leisure as the intermediary variable. After adding control variables (including work and children related variables), labor income has a significant negative impact on leisure, while total revenue and first childbearing age have no significant impact on leisure. In the regression excluding labor income, the first childbearing age has a significant negative impact on leisure at the level of 10%, indicating that there are some intermediary effects among first childbearing age, labor income and leisure. Columns (4) and (5) show that leisure has a significant positive impact on happiness. Compared with the benchmark regression results, after adding leisure, the coefficient values of first marriage age and first childbearing age hardly change, but the coefficient values of total revenue and labor income change to some extent. It shows that the increase of labor income will reduce leisure time, while the decrease of leisure time will reduce happiness.

Table 11 Bootstrap method

Intermediary variable	(1) Income	(2) Labor	(3) Child	(4) Gchild	(5) Leisure
Indirect effect	0.0000 (0.0001)	-0.0002* (0.0001)	-0.0005* (0.0002)	-0.0015*** (0.0006)	-0.0055*** (0.0018)
Direct effect	-0.0101*** (0.0039)	-0.0098** (0.0043)	-0.0079*** (0.0028)	-0.0066* (0.0035)	-0.0291* (0.0175)
Control variable	Y	Y	Y	Y	Y

Observations	4,448	4,448	4,448	2,438	4,448
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Table 11 shows the results of bootstrap test. The control variables are consistent with tables 9 and 10. The indirect effect of total revenue as an intermediary variable did not pass the significance test, indicating that the first childbearing age will not affect happiness through total revenue. It can be seen from column (2) that labor income has a significant negative correlation with the mediating effect of first childbearing age on happiness, and first childbearing age has a direct negative effect on happiness. Labor income has a partial mediating effect on the impact of first childbearing age on happiness. It shows that delaying the first childbearing age reduces leisure by increasing labor income, and then reduces happiness. From column (3), the number of children has a significant negative correlation with the mediating effect of the first childbearing age on happiness, and the first childbearing age has a direct negative effect on happiness, indicating that there are some mediating effects, that is, delaying the first childbearing age reduces happiness by reducing the number of children. From the value of indirect effect coefficient, it can be seen that the intermediary effect of grandchildren is the largest (of course, the sample size here is small, all is more than 45 years old), the intermediary effect of the number of children is the second, and the intermediary effect of labor income is the smallest. Column (5) takes leisure as the intermediary variable to investigate the impact of labor income on happiness. Its indirect and direct effects have been tested by 10% significance level, and the symbols are negative, indicating that delaying the age of first childbearing reduces happiness by reducing the probability of having grandchildren at the same age.

## 5. Conclusion

In an era of strict family planning policy, the slogan "late marriage and late childbirth, fewer and better children, then happy life" is very popular. Early marriage and childbearing are now extremely rare in China, while late marriage and childbearing have become the norm. We examine whether late marriage and late childbirth are happier based on micro data from the Chinese General Social Survey. According to the baseline estimation results, the first marriage age or marriage age has no effect on happiness, whereas the first childbearing age has a significant negative effect. The robustness test demonstrates that the replacement estimation method and replacement sample regression results are consistent with the benchmark regression results. Heterogeneity analysis shows that the first marriage age has no significant impact on the happiness of people of different ages, genders and household accounts, while the first childbearing age has a significant negative impact on the happiness of the three groups. Among them, the negative impact on the young people is greater than that on the old people, the negative impact on men is greater than that on women, and the negative impact on rural residents is greater than that on urban residents.

Based on the above regression results, we further analyze the mechanism of the impact of first marriage age and first childbearing age on happiness. The analysis shows that for married people, there is a high positive correlation between first marriage age and first childbearing age, and the impact of the first marriage age on happiness will be replaced by the impact of the first childbearing age on happiness. The mediating effect test shows that first childbearing age mainly affects happiness through three ways. First, delaying the first childbearing age will increase labor income and reduce happiness, that is, the increase of labor income will reduce leisure time and reduce happiness. Second, delaying the first childbearing age will reduce the

number of children, thus reducing happiness; Third, delaying the first childbearing age will reduce the probability of having grandchildren at the same age, thus reducing happiness. In short, late marriage and late childbirth not only reduce happiness, but also reduce the chance of having children again, resulting in a decline in the total fertility rate and aggravating the problem of population aging.

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