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Fertility Decline and Women's Empowerment in China

Xiaogang Wu*
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ABSTRACT

The literature typically treats fertility decline in developing countries as an indicator of women's status improvement, based on the assumption that women have greater decision making power on childbearing as their status improves. This paper investigates whether and how fertility decline leads to reduction in gender inequality and the improvement of women's status in China. Based on the analyses of data from two nationally representative surveys, we show that women with lower fertility do less housework and tend to be more satisfied with their status within family than women with higher fertility. Such effects are more pronounced for women in more recent marital cohorts. Across generations, lower fertility implies fewer siblings and daughters benefit more in terms of years of schooling and subsequently occupational attainment.

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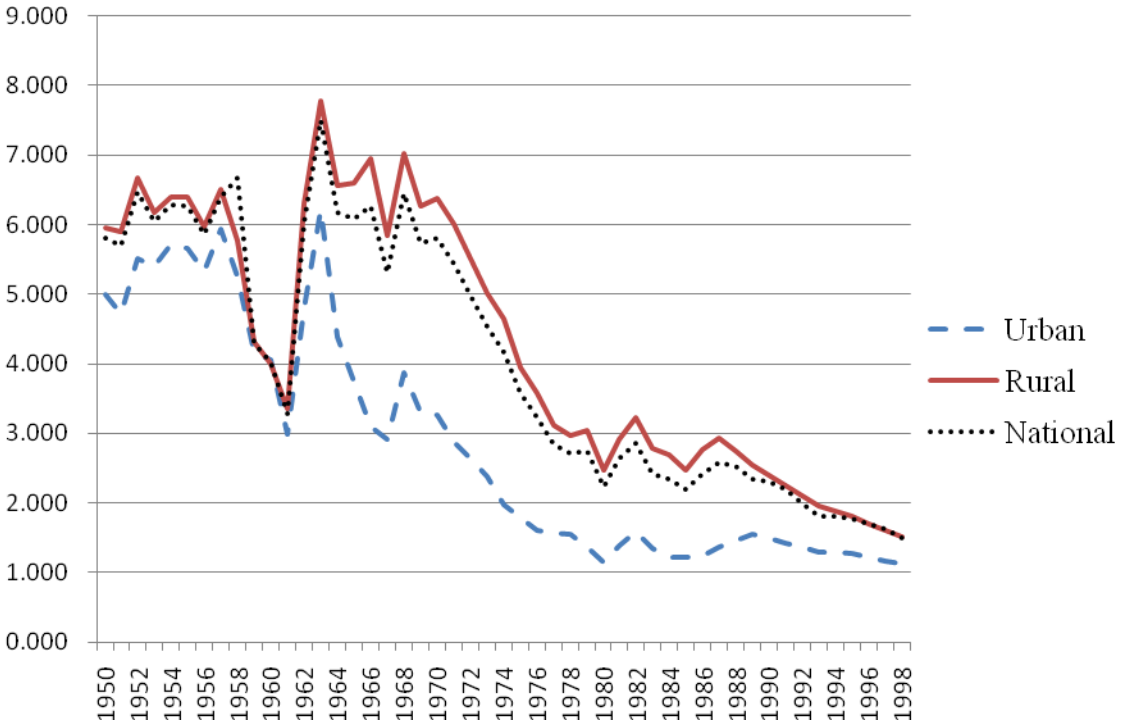
INTRODUCTION

During the past four decades, China, like other developing countries, has experienced a dramatic decline in fertility. This decline reflects a number of key demographic and policy changes. The 1950s witnessed a population boom in China (Bongaarts and Greenhalgh 1985). While the country's birth rate remained at around 35 per thousand, the death rate halved from 20 per thousand to about 10 per thousand from 1949 to 1965, with an exception for the period of the Great Leap Forward and the subsequent famine (Scharping 2003).[1] The decline in the death rate was largely due to improvement in healthcare and recovery from years of war. Consequently, the first decades of the People's Republic witnessed a rapid population growth from 541,670,000 in 1952 to 829,920,000 in 1970, reaching a peak in the natural growth rate of 33.33 per thousand in 1963 (National Bureau of Statistics 2009, p. 1), due to both the increase in fertility and decline in mortality.

Concerned that overpopulation could hinder economic development and the improvement of living standards, the Chinese government rolled out the first national birth control campaign in 1971, with the slogan "later-longer-fewer" (*Wan Xi Shao*), referring to later marriage, longer birth spacing, and fewer children (Bongaarts and Greenhalgh 1985; Presser et al. 2006). A more stringent one-child policy was implemented when China started its economic reform in 1978. To limit the total population to 1.2 billion by 2000, the new Constitution of the People's Republic of China in 1978 declared state advocacy for birth planning, and the Marriage Law of 1980 required every couple to abide by the birth control policy (Bongaarts and Greenhalgh 1985). As a result, as shown in Figure 1, the total fertility rate dropped from 5.8 children per woman in 1970 to 2.7 in 1979, and was further reduced to 1.5 by the late 1990s (Poston et al. 2006).

[1] The Great Leap Forward from 1958 to 1961 was an economic and social campaign of the Chinese Communist Party, which aimed to rapidly transform the country from an agrarian economy into a modern communist society through the process of rapid industrialization and collectivization. The campaign ended in catastrophe, resulting in tens of millions of excess deaths (Peng 1987).

Figure 1: China's Total Fertility Rate, 1950-1998



Source: Table 1.1 on page 12 of Poston *et al.* (2006).

Scholars studying fertility decline in developing countries tend to focus on changing gender relationships and improvement of women's status as key causes of fertility decline (Mason 1987). Women's education and labor force participation are two common indictors of women's' socioeconomic status. In many developing countries, education has begun to increase at a faster pace for women than for men and gender gaps in schooling have also been shrinking (Buchmann and Hannum 2001). Consequently, female labor force participation has increased in most countries and women have gained more economic independence over time (Brinton, Lee, and Parish 1995; Buchmann, DiPrete, and Anne McDaniel 2008; Yu 2005).

Empirical research has shown that fertility is negatively associated with women's education and employment (Axinn and Barber 2001; Mason 1987), not only because women's improved education exposes them to modern values and ideas that emphasize individualism and gender egalitarianism (Inglehart and Norris 2003), but also because women's economic independence enables them to decide for themselves the number of children they wish to have (Mason 1987). In other words, the argument has been that women's empowerment--as measured by their increasing educational

attainment and labor force participation--has contributed to fertility decline (Jejeebhoy 1995; Lam and Duryea 1999).

In the case of China, the socialist state has long played a strong role in both promoting gender equality and controlling fertility. After the establishment of the People's Republic of China in 1949, Mao Zedong envisioned a China in which women would "hold up half the sky" and called for "genuine equality" between men and women under the new regime. As Mao Zedong (1955) put it,

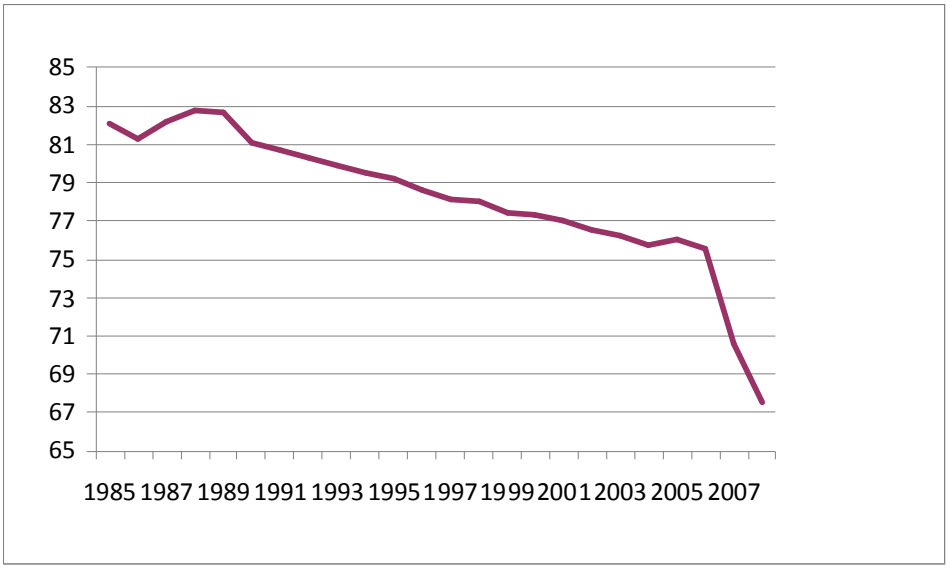
> "*In order to build a great socialist society it is of the utmost importance to arouse the broad mass of women to join in productive activity. Men and women must receive equal pay for equal work in production. Genuine equality between the sexes can only be realized in the process of the socialist transformation of society as a whole*."

This vision of gender equality was mixed with ideas of nation building and labor mobilization, and socialist egalitarianism was pushed by communist social policy during a particular period of the revolt against traditional patriarchy in Chinese society (Honig and Hershatter 1988). As a result, female labor force participation reached a very high level in the socialist period. According to data from the 1982 census, 85.3 percent of Chinese women ages 15 to 54 (excluding students and retirees) held a job, far higher than any other country with a similar level of economic development, and also higher than other Chinese societies such as Hong Kong or Taiwan (National Bureau of Statistics 2005).

Chinese women's high rate of labor force participation since the 1950s was a direct consequence not so much of their improved educational opportunities relative to men's, but of government intervention (Hannum and Xie 1994; Lu and Treiman 2008). Indeed, gender inequality in education fluctuated in the first three decades of the People's Republic of China, and only in recent years has the country witnessed a dramatic improvements in women's education relative to men's, largely due to economic development and educational expansion since the 1980s (Hannum 2005; Ye and Wu 2011). Wu and Zhang (2010) reported that women's disadvantage in education has been reversed among the youngest cohort.

Ironically, whereas Chinese women have started catching up in educational attainment in recent decades, their labor force participation rate has been falling since the mid-1980s from 82.1 percent in 1985 to 67.5 percent in 2008,[2] as shown in Figure 2. This trend was due to economic restructuring in the 1990s, during which middle-aged women were more likely to be laid off (Wu 2010).

Figure 2. Rate of Female Labor Force Participation in China, 1985-2008



Data Source: National Bureau of Statistics of China, *China Economic Statistical Yearbook*; China InfoBank (http://www.infobank.cn/).

As noted earlier, the literature has consistently shown that women's education and employment status are negatively associated with fertility in developing countries (Axinn and Barber 2001; Mason 1987). Yet China's fertility decline since the 1970s is not linked to trends in gender equality in either education or employment, but rather is directly caused by a change in the state birth control policy. While Chinese women's higher rate of employment was achieved in the 1950s, their educational attainment improved only in the 1990s after decades of fertility decline and

[2] The data on female labor force participation in China before the mid-1980s are not available, but the rates were presumably higher. The author's calculation from the 1982 population census showed that 85.3 percent of women aged between 20 and 54 were employed.

government policies to expand education (Wu and Zhang 2010). The visible hand of the socialist state has thus played a strong role in driving the changes in women's employment, education, and fertility at different paces according to its policy agenda in different historical periods.

Clearly, women's improvement in socioeconomic status is not the leading cause of fertility decline in China since the 1970s. Fertility decline, nevertheless, has yielded many profound economic and social consequences, such as economic growth, population aging, and improvements in children's wellbeing, that have also increasingly received research and policy attention. The impact of reduced fertility on gender equality has rarely been addressed. In this paper, we aim to elucidate how having fewer births leads to the empowerment of women and empirically test a set of related hypotheses with national representative survey data collected in China.

CHILD BIRTH AND THE PATHWAY TO WOMEN'S EMPOWERMENT: AN ANALYTICAL FRAMEWORK

In this section we discuss the different ways in which women's fertility and status are linked to each other. In very general terms, women's empowerment is a dynamic process and many factors contribute to women's improved status relative to men's.[3] This trend is based on the fact that women were historically disadvantaged in the gendered division of labor (Alesina, Giuliano, and Nunn. 2011).While men were bread winners of families and dominated the gender relationship; women were responsible for human reproduction and household chores. The role differential, legitimized through either economic calculation or gender ideology (Becker 1991; Goldscheider and Waite 1986; West and Zimmerman 1987), expects married women to give birth, raise children, and take care of domestic work. Women's economic dependence upon their spouses makes their education and employment unnecessary, and thereby their subordination to men inevitable.

[3] As Safilos-Rothshild (1982) pointed out, women's education and labor force participation may not be the most sensitive measures of women status to study the relationship between status and fertility rates, because reproduction is a behavior occurring at the micro level, it is a woman's relative power to her spouse that determines the birth decision. Thus women's power/autonomy within the household should be distinguished from the status of women in the society (also see Dyson and Moore paper 1983). Since this paper is mainly concerned with the consequences of fertility decline, we focus on women's wellbeing and status in the society, despite the fact that we use the terms empowerment, power, status and relative status interchangeably.

Child birth is an important life event that fulfills one of women's principal gender roles. As discussed in the introduction section, a common argument is that the empowerment of women, as measured by education and labor force participation, has led to the fertility decline (Jejeebhoy 1995; Mason 1987). Formal schooling not only equips women with knowledge and skills for economic activities in the labor markets but also serves as a crucial catalyst for changes in values and gender ideology (Inglehart and Norris 2003; Stember 1961; Thornton 1983). From a sociological perspective, women's economic and social independence resulting from their improved education are increasingly incompatible with their traditional roles as mothers and homemakers. On the one hand, an increase in schooling often delays marriage and reduces the duration of a woman's reproductive period. On the other hand, women may be increasingly able to limit the number of children they have because employment has rendered them more economically independent and the opportunity cost of having children would also be greater, especially for those better educated and with higher career aspirations.

Nevertheless, such a causal link captures only one part of the complicated relationship between women's changing socioeconomic status and declining fertility. Although most women gave birth only after they have left school and completed education (Bledsoe and Casterline et.al. 1999; Rindfuss and Morgan 1996), decisions on birth and employment might be intertwined. In other words, because of the dual role played by women as mothers and homemakers, while empowered women may be able to make birth decisions, child birth and family obligations may also hinder career development and earnings growth (Staff and Mortimer 2012). Due to gender asymmetry in the division of domestic labor, working women are still required to spend a substantial amount of time on housework, making it difficult to strike a balance between career and family (Blossfeld 1995). Many women opt to withdraw from the labor force at a certain life stage to take care of their children and families, and even more choose careers that are more "suitable" for women so that they could fulfill their prescribed gender roles. Therefore, a reverse causality may also exist: marriage and subsequent childbirth (fertility) may yield negative effects on women's empowerment in a society in terms of career development and earnings.

The Gender Empowerment Measure (GEM), an index ranging from 0 to 1 which measures women's status in a country based on the combination of the following items: the percentage of parliamentary seats held by women, the percentage of administrators and managers who are women, the percentage of professional and technical workers who are women, and women's share of earned income compared with that of men. In some countries, The GEM index may be

inconsistent with the measurement of women's status by education and labor force participation. Despite the five decades of socialist gender egalitarian policies, the GEM was still only 0.533 in 2006 in China, compared with 0.726 in Taiwan, where the rate of the female labor force participation was much lower (United Nations Development Programme 2009; Yu and Xie 2012). It is clear that not only is women's status relative to men's affected by the visible hand of the state, but it is also subject to marriage and family relationship constraints. In other words, to understand the process of women's status at the societal level, particular attention needs to be paid to women's relative status to their marital spouses within the family (see footnote 3).

For a married woman, a key variable adversely associated with her labor market attainment is childbearing. Because of gender role differentials in childbearing and traditional gender ideology exhorting women to spend more time on taking care of their husbands and children, women tend to spend more time on domestic housework than their spouses. As a result, the tension between work and household labor is more pronounced for women than for men (England and Farkas 1986). Additionally, married women tend to reduce the amount of effort they invest in their careers (Becker 1991). Therefore, a woman's number of births has important implications for her share of housework and time committed to her family, both of which would distract her from work and career advancement in the labor market.[4]

Moreover, there is a second pathway through which childbirth affects women's (daughter's) process of status attainment. Women's number of births indicates the sibship size of their children's generation, an important feature that characterizes the structure of the family. Sociologists have shown a continuing interest in identifying factors that affect intra-family resource allocation for children's educational advancement, among which a prominent one is sibship size (Cicirelli 1978; Heer 1985; Steelman et al. 2002).

Previous literature on the effect of sibling configuration has consistently shown that sibship size is negatively associated with an individual's educational attainment (Kuo and Hauser 1997; Steelman

[4] While the relative amounts of resources the husband and the wife bring from the labor market may affect the division of housework to some extent, women still need to shoulder disproportionately more housework to display their gender roles as wives and mothers (Brines 1994; Yu and Xie 2012).

et al. 2002). A common explanation for the effect of sibship size on educational attainment is the resource dilution thesis. Some familial resources, such as parental interactions with children, affect children's intellectual development and thus educational attainment indirectly. Other resources, such as financial resources which reduce the need for children to leave school to contribute to family incomes, affect educational attainment directly (Downey 1995). According to Blake (1981), the amount of resources that can be allocated to any given child depends on both the total amount of resources and the number of children in the family. The larger the sibship size, the closer the child spacing, the greater the dilution of family resources, and in turn the lower the educational attainment of each child (Ye and Wu 2011).

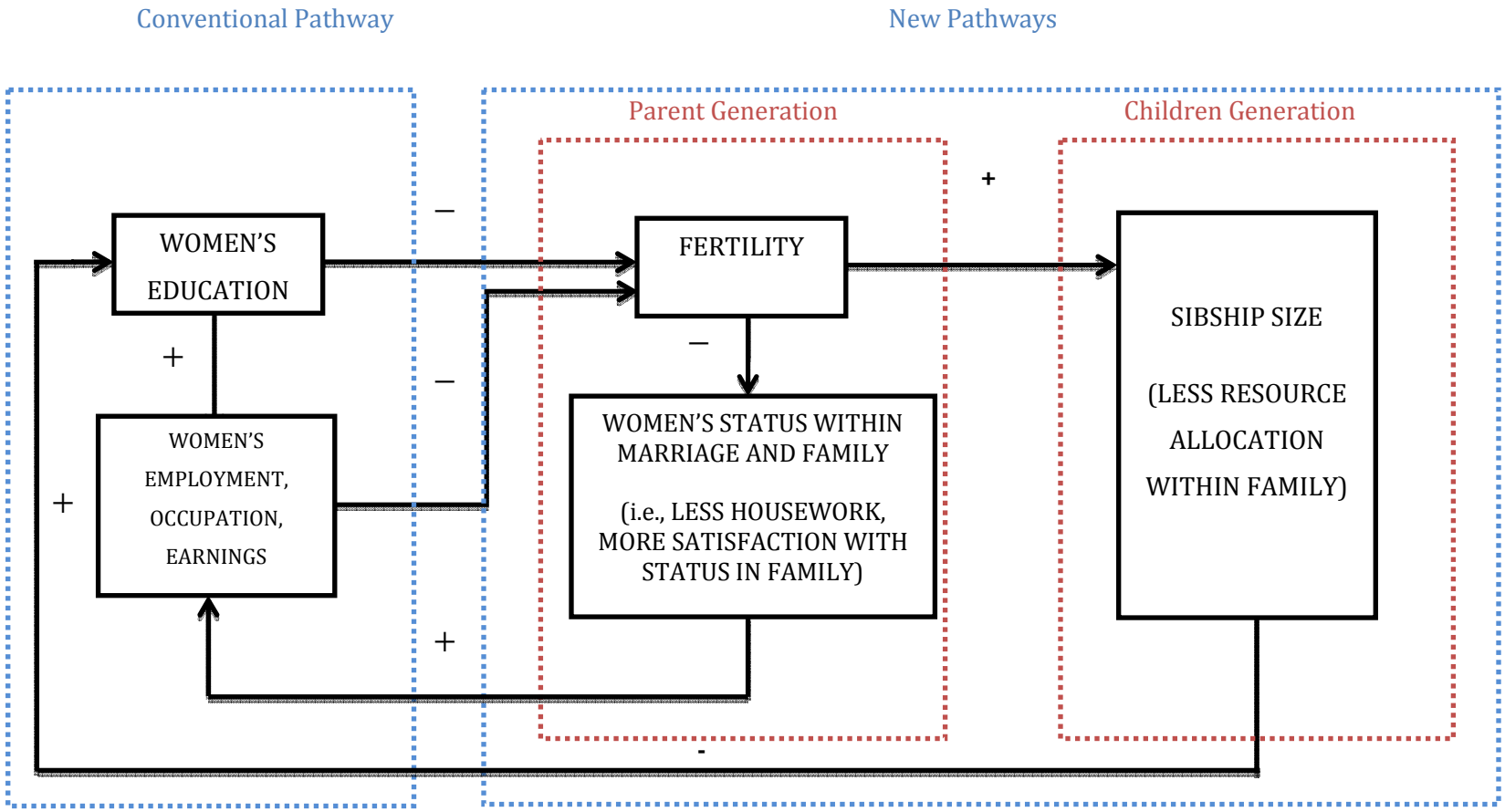
The allocation of educational resources could also depend on the gender composition of siblings and parental preferences on investment in children's education, especially in developing countries. Chu, Xie, and Yu's (2007) research on Taiwan showed that the negative effects of sibship size on educational attainment were the strongest for girls who had younger brothers and sisters. Under the strong influence of a Chinese patriarchal culture, couples with more children were more likely to be constrained by family resources for children's education, and they typically had higher expectations on sons and tend to invest more in their sons' education than in their daughters'. With limited resources available, girls were more likely than boys to give up schooling and work to support their brothers' education, especially in the East Asian context (Chu, Xie, and Yu 2007).

The birth control policies in China since the early 1970s have lowered fertility rates and changed family size. Thus they have had significant implications for family investment in children's education and thereby educational gender inequality. For Chinese couples who abide by the state's one-child policy, their investment in children's education would not be biased toward sons for two reasons: they are typically better off than those who have more than one child and thus are subject to less resource constraints; they will invest in their only child regardless of the child's gender. Research has shown a substantial reduction in the mean differences in schooling between men and women in China, especially for the young cohort born after the one-child policy was implemented (Wu and Zhang 2010). Also, fertility decline is an important factor accounting for the reduction in women's disadvantage in education (Ye and Wu 2011).

Figure 3 summarizes the complicated and dynamic pathway through which the process of women's empowerment and fertility change enhance one another. While conventional research has devoted much attention to how women's improved education and socioeconomic status have contributed to

fertility decline, we highlight the impact of fertility reduction on women's empowerment in two ways. First, giving birth may affect women's status within marriage and the family, which may further affect their involvement in market work and thus socioeconomic attainment. Second, women's fertility is directly related to how many children they have (i.e. sipship size in the next generation), which inversely affects their children's educational attainment. A smaller sibship size resulting from fertility decline would favor girls' education and thus would contribute to a reduction in educational gender inequality in the next (their daughters') generation. In both pathways, marriage and family serve as important agents in resource allocation (between women and their husbands and between sons and daughters) in the context of fertility decline.

Figure 3. Child-bearing and the Pathway to Women's Empowerment: An Analytical Framework



Given the fact that the fertility decline in China since the 1970s largely resulted from the state policy intervention rather than the improvement of women's status, as measured by the increase in education and labor force participation, this paper focuses on how fertility decline leads to the empowerment of women both within and outside their families. Based on the analysis of data from two national representative surveys, we propose and test hypotheses on the impact of fertility on women's status within family and marriage and on educational gender inequality in their children's generation.

RESEARCH HYPOTHESES

We attempt to answer two sets of questions in this paper by proposing and testing six hypotheses. First, does the number of children that a married woman has affect her share of housework and satisfaction with her status within the family and marriage? And how do these effects change over time (i.e., from one cohort to another)? Second, how does changing sibship size resulting from the decline in parental fertility affect women's educational and occupational attainment relative to men's?

Our empirical analysis in this paper is divided into two parts. We argue that lower fertility rates increases married women's status relative to their husbands' (men) within the family. Time allocation and division of household work are important indicators of women's power status. As fertility declines, women on the whole spend shorter periods of their overall lifespan on childbearing and childrearing. Therefore, the number of births has significant implications for their family lives and careers.[5] Because of gender role expectations, even if a married woman holds a job, as her husband does, she is expected to devote more time and effort to children and family as a wife and a mother. The more children she has, the more attention and time she needs to devote to family life. This is also the case in the context of Chinese society (Yu and Xie 2012). Therefore, we propose the following hypothesis:

[5] Despite the increase in education and labor force participation, Chinese women's subordinate status at the home and gender norm have not changed substantially. Having fewer children, women can then relieve themselves of some of the burden of child caring and housework and thus be empowered in this sense.

Hypothesis 1. *The more children a woman has, the larger her share of housework would be relative to her husband's share within the family.*

Because of the increase in education and labor force participation, women's compliance with traditional gender roles may not be voluntary. Instead, not only may the tension between family and work hinder their career development, it may also affect their perceived status within the family, for which Hypothesis 2 is testable.

Hypothesis 2. *The more children a woman has, the less satisfied she would be with her self-perceived status in the family.*

We examine two dimensions of women's status within marriage and family in relation to fertility: their share of housework and their satisfaction with their perceived status in the family. A reduction in the number of child births across each cohort contributes to less of a burden on women in terms of housework and greater satisfaction with their perceived status in the family. Within the same marriage cohort, however, women who give birth to more children against the general trend of declining fertility within the same marital cohort are subject to a larger burden of housework and are less satisfied with their status within the family. Hypothesis 3 is thus proposed.

Hypothesis 3. *The negative effect of childbearing on women's status tends to be stronger in younger cohorts than in older cohorts.*

Across generations, lower fertility implies fewer siblings for the next generation. It is well known that an individual's educational attainment is negatively associated with sibship size. Due to resource constraints and son preference, parents with more children tend to sacrifice the wellbeing of girls for better education for boys. As typically observed in Chinese societies, girls tend to leave school earlier and earn cash income to help support their brothers' education (Chu, Xie and Yu 2007). This fact provides another perspective on gender disparities in educational and other socioeconomic outcomes. In other words, because of son preference, daughters in a Chinese family with a mixture of sons and daughters tend to be disadvantaged in schooling. We expect a first-order interaction between gender and sibship size in educational attainment which can be tested in the following hypothesis:

Hypothesis 4. *Women's disadvantage in education is larger for those with more siblings.*

A similar hypothesis can be posed with regard to the effect of sibship size on gender inequality in occupational attainment, although the effect may be indirect and may occur through education.

Hypothesis 5. *Women's disadvantage in occupational attainment is larger for those with more siblings.*

Because fertility decline yields fewer siblings in the children's generation, those with more siblings against the trend may be placed in a more disadvantaged position. We expect the detrimental effect of sibship size on women's educational attainment relative to men's to be even stronger across birth cohorts and propose our last hypothesis:

Hypothesis 6. *The negative effects of sibship size on women's status are more pronounced among the younger cohorts than among the older cohorts.*

DATA, VARIABLES, AND MEASURES

DATA

To examine the impact of fertility (number of children) on married Chinese women's status within the family and test Hypotheses 1-3, we analyze data from the Women's Status Survey, a national representative survey of about 19,449 individuals aged between 18 and 64, including both men and women. The survey, jointly conducted by the Chinese Federation of Women and the China National Bureau of Statistics in 2000 (hereafter WSS2000), includes questions on fertility, gender roles, marriage, the household division of labor and labor market activities. We restrict our analysis to the 8,531 married women who took part in the survey.

To examine how reduced sibship size resulting from a decline in fertility affects gender equality in educational and occupational attainment in the subsequent generation and test Hypotheses 4-6, we base our analyses on the China General Social Survey. The China General Social Survey is an annual survey involving a nationally representative sample of the adult population—those aged 18 or above—in both rural and urban China except for Tibet.[6] The survey in 2006 (hereafter CGSS2006)

[6] Here we assume that those who aged 18 or above come from family with parents having completed childbearing.

contains 10,151 completed interviews of adults, with unique information on sibling configuration, i.e., the numbers of elder brothers, elder sisters, younger brothers, and younger sisters each interviewee had. Sibship size can be obtained by adding the numbers of sisters and brothers together. As far as we know, such information is not available from other comparable surveys. We restrict our sample to those born between 1949 and 1988, i.e. men and women aged between 18 and 57 at the time of the survey.

Variables and Methods

For the first part of the analysis using WSS2000, we employ two dependent variables to measure women's status within the family and marriage – division of housework and satisfaction with perceived status. Respondents are asked two questions. For the first question, "Who does more housework?", there are three possible choices: the husband, the wife, both about the same. As the question is answered by married women, we treat it as an ordinal variable measuring women's share of housework. The second question, "How satisfied are you with your status within the family?" uses an ordinal scale, with 1 indicating very unsatisfied and 4 indicating very satisfied.

The key independent variable is the number of children the respondent has, which is treated as a continuous variable in the analysis. Other control variables are education, work status, residence, and marriage cohort. Education is coded into four levels: primary school or below, junior high school, senior high school, and college or above. These levels are treated as a set of dummy variables in multivariate models. Work status is a dummy variable, indicating whether or not the respondent was involved in any paid work at the time of the survey (1 if yes and 0 otherwise). Rural residence is also a dummy variable. To examine the temporal trends, we split all respondents into four marriage cohorts based on the year they were married: 1952-1970, 1971-1980, 1981-1990, and 1991-2000.

For the second part of the analysis using the data from the CGSS2006, the dependent variables are educational attainment, measured by the number of years of schooling completed as a continuous variable, and occupational status, measured by the International Socioeconomic Index of Occupations (ISEI), ranging in principle from 0 to 100 (Ganzeboom, De Graaf, and Treiman 1992).

In this part of the analysis, our central interest is in how gender inequality in education is affected by sibship size over time. Therefore, the key independent variable is the respondent's gender, which is coded as a dummy variable (female=1), and sibship size when the respondent was at age

10 as a continuous variable. In this way we measure the sibling effect on the dilution of family resources for children's educational advancement when they grew up.

Family socioeconomic background is an important predictor of educational attainment. We use two proxy measures of family background as control variables: the household registration status, also known as *hukou*,[7] and father's occupational status when the respondent was age 18. One's *hukou* status has important causal effect on educational attainment (Wu 2012), although people can change *hukou* later in their life, mostly by receiving higher education (Wu and Treiman 2004). We take the current *hukou* status (if the respondent has never changed *hukou*) or *hukou* status at age 7 (if the respondent has changed *hukou*) as the respondent's *hukou* origin to examine its impact on educational attainment. Father's occupation at the time when the respondent was at age 18 is another indicator of the influence of family background, especially the financial capacity of a family to support its children's education. It is also measured by the ISEI.

Because the second part of the analysis includes both men and women, regardless of marital status, we use birth cohorts instead of marriage cohorts to approximate periodic variations. Birth cohorts are coded into three categories: 1949-1970, 1971-1978, and 1979-1988, corresponding to the changes in China's birth control policy. The first cohort (1949-1970) was not subject to birth control policies; the second cohort was born during China's first national birth control campaign which began in 1971; and the third cohort was born after China started implementing its strict one-child policy, i.e. in 1979. We expect women's educational attainment to increase as sibship size declines across birth cohorts.

For both data sets, we use sampling weights to compute figures representative of the general population in China. The clustering effect on principal sampling units is also taken into account and robust standard errors are presented.

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[7] The household registration system (*hukou*) has served as an important administrative means for the state to deal with demographic pressures in the course of rapid industrialization since the 1950s. Under the *hukou* system, every Chinese citizen is assigned either an agricultural (rural) *hukou* or a non-agricultural (urban) *hukou* at birth, and people with a rural *hukou* are entitled to few of the rights and benefits that the state confers on urban *hukou* holders, such as medical insurance, pensions, and educational opportunities for children (Wu and Treiman 2004, 2007; Wu 2011).

EMPIRICAL FINDINGS

Fertility Decline and Women's Status within Family

Table 1 presents descriptive statistics for the selected variables from WSS2000 among the entire sample and also for four marriage cohorts. Overall, among Chinese couples, 76.8 percent of wives perform more housework than husbands on average, despite some variations across different marriage cohorts, especially for those married between 1971-1980 and 1981-1990, who may still have non-adult children or aged parents to take care of. On the other hand, most women seem to be satisfied with their family status, although younger cohorts are slightly less satisfied than older cohorts.

Table 1. Descriptive Statistics for Selected Variables, Chinese Women, 2000

	Overall Sample	Marriage Cohort			
		1952-70	1971-80	1981-90	1991-00
Who does more housework within family (%)					
Husband	8.58	10.46	8.68	7.77	8.66
Same	14.66	14.68	13.26	13.89	17.06
Wife	76.76	74.85	78.06	78.33	74.30
Satisfaction with family status[1]	3.301 (0.617)	3.361 (0.621)	3.346 (0.607)	3.288 (0.611)	3.250 (0.627)
# of children, mean (SD)	1.939 (1.094)	3.297 (1.120)	2.239 (0.982)	1.753 (0.798)	1.142 (0.589)
Education (%)					
<=Primary	43.73	73.38	56.55	34.76	29.29
Junior high	32.82	17.20	28.10	37.89	38.21
Senior high	18.92	7.41	12.66	22.99	22.03
>=College	5.15	2.00	2.70	4.36	10.47
No job (1=yes)	14.26	17.95	12.48	12.33	16.60
Rural resident	51.80	51.44	54.25	53.49	47.23
N	8,531	1,316	1,732	2,815	1,814

Note: The numbers in the table are weighed by population distribution of China.
[1]Satisfaction with family status is an ordinal variable with 1=very unsatisfied, 2=somewhat unsatisfied, 3=somewhat satisfied, 4=very satisfied.

Table 1 also shows the trend in fertility decline. Chinese couples on average have 1.94 children: 3.30 children for those married before 1971, 2.24 for those married between 1971 and 1980, 1.75 for those married between 1981 and 1990, and 1.14 for those married after 1991. Education increases across marriage cohorts: in the oldest cohort, only 7.4 percent completed a senior high school education and 2.0 percent completed college education or above, whereas in the youngest cohort, the corresponding figures are 22.0 percent and 10.5 percent, respectively. In our sample, only about 14.3 percent of married women do not work.

We examine the relationship between fertility and women's status within family as measured by two indicators. Table 2 presents estimated coefficients for the ordinal logit models predicting the share of housework for the entire sample and for each of the four marriage cohorts. A positive coefficient suggests that women tend to perform more housework than their husbands, other things being equal. As shown in the table, women with more children tend to perform a greater share of the housework: one additional child increases the net odds by 14.1 percent ($=e^{0.132}$). [8]

[8] To check whether the effect of the child births is linear or not, we compare two nested models, one with linear specification whereas the other includes the number of children as a set of dummy variables. Likelihood ratio test shows that $\chi^2=4.67$, with 4 degrees of freedom, and the difference is statistically insignificant. Hence, linear specification in the model is appropriate.

Table 2. Ordinal Logit Model for Women Who Do More Housework, Women Status Survey, China, 2000

	Female Sample	Marriage Cohort			
		1952-70	1971-80	1981-90	1991-2000
# of kids	0.132**	0.041	0.072	0.156*	0.390**
	(0.042)	(0.061)	(0.075)	(0.068)	(0.119)
Education (primary or below [omitted])					
Junior high	-0.122	-0.398*	-0.015	-0.066	-0.092
	(0.074)	(0.157)	(0.155)	(0.123)	(0.145)
Senior high	-0.437***	-0.555**	-0.470*	-0.295*	-0.534**
	(0.089)	(0.210)	(0.200)	(0.144)	(0.179)
College or above	-0.499***	-0.334	-0.649*	-0.312	-0.617**
	(0.118)	(0.320)	(0.258)	(0.191)	(0.214)
Marriage cohort (1952-70 [omitted])					
1971-80	0.388***				
	(0.097)				
1981-90	0.521***				
	(0.099)				
1991-00	0.338**				
	(0.120)				
No job	0.305***	0.442*	0.380	0.186	0.330*
	(0.080)	(0.193)	(0.199)	(0.125)	(0.153)
Rural	0.092	0.153	0.099	0.165	-0.100
	(0.082)	(0.153)	(0.152)	(0.116)	(0.151)
Cutoff point 1	-1.833	-2.077	-2.234	-2.208	-2.138
	(0.147)	(0.240)	(0.225)	(0.172)	(0.222)
Cutoff point 2	-0.643	-0.957	-1.135	-1.035	-0.801
	(0.147)	(0.233)	(0.211)	(0.165)	(0.209)
N	8,531	1,316	1,732	3,469	2.014
Log likelihood	-5,919.948	-955.859	-1,146.302	-2,298.717	-1,504.979

Notes: Numbers in parentheses are robust standard errors adjusted for clustering in counties.

*** p<0.001, **p<0.01, * p<0.05

Education and employment are two viable means to empowering women in the society and enhancing their status within the family. Education decreases a married woman's share of housework, whereas a woman without a job tends to perform a larger share of housework. Moreover, women married more recently, who are likely to have non-adult children and aging parents to look after, tend to perform more housework. To investigate how the effect of fertility on housework by marriage cohort and test Hypothesis 3, we replicate the models for each cohort. For those married during 1952-1970 and 1971-1980, the number of children they have does not affect their share of housework, whereas for those married during 1981-1990 and 1991-2000, the number of children significantly increases their share of housework. One additional child increases

the net odds of sharing more housework by 4.18 percent ($e^{0.041}$-1) for those married between 1952 and 1970, 7.47 percent ($e^{0.072}$-1) for those married between 1971 and 1980, 16.9 percent ($e^{0.156}$-1) for those married between 1981 and 1990, and 47.7 percent ($e^{0.390}$-1) for those married between 1991 and 2000. The chi-square tests show that such increases are statistically significant ($p<.01$).

In Table 3, we examine how fertility affects women's satisfaction with their own perceived status within family. Results show that the number of children has a negative impact on women's satisfaction with their own family status. Other things being equal, one additional child reduces the net odds of being more satisfied by 7.96 percent ($1-e^{-0.083}$), and the effect is statistically significant ($p<.05$). Education affects women's satisfaction with their family status non-monotonically. Those women with high school education are more satisfied than both women with primary education or below and women with college education or above. Again, women in the younger marriage cohorts are less satisfied than those in the older marriage cohorts. Perhaps young generation of women are butting up against the continuing hurdles to attaining real positions of power; they are more educated but shoulder more dual burden between housework/childcare and labor market participation.

Table 3: Ordinal Logit Model for Satisfaction with Perceived Family Status, Women Status Survey, China, 2000

	Female Sample	Marriage Cohort			
		1952-70	1971-80	1981-90	1991-2000
# of kids	-0.083*	0.049	-0.128*	-0.138*	-0.195*
	(0.033)	(0.056)	(0.057)	(0.059)	(0.087)
Education (primary or below [omitted])					
Junior high	0.229***	0.274*	0.179	0.332***	0.006
	(0.060)	(0.138)	(0.111)	(0.093)	(0.122)
Senior high	0.201**	0.413*	0.053	0.334**	-0.067
	(0.071)	(0.200)	(0.156)	(0.105)	(0.158)
College or above	0.054	0.686	0.109	-0.003	-0.147
	(0.103)	(0.410)	(0.279)	(0.161)	(0.168)
Marriage cohort (1952-70 [omitted])					
1971-80	-0.213*				
	(0.084)				
1981-90	-0.478***				
	(0.088)				
1991-00	-0.656***				
	(0.109)				
No job	-0.092	-0.019	-0.173	-0.105	-0.725
	(0.070)	(0.162)	(0.139)	(0.108)	(0.129)
Rural resident	0.011	-0.293*	0.100	0.132	-0.026
	(0.078)	(0.140)	(0.137)	(0.097)	(0.132)
Cutoff point 1	-5.423	-5.143	-5.345	-4.876	-5.105
	(0.182)	(0.437)	(0.330)	(0.244)	(0.284)
Cutoff point 2	-3.123	-2.803	-2.976	-2.684	-2.713
	(0.136)	(0.253)	(0.190)	(0.151)	(0.177)
Cutoff point 3	0.020	0.354	0.135	0.546	0.352
	(0.129)	(0.210)	(0.154)	(0.138)	(0.168)
N	8,531	1,316	1,732	3,469	2.014
Log likelihood	-7605.03	-1143.89	-1533,66	-3067.85	-1842.62

Notes: Numbers in parentheses are robust standard errors adjusted for clustering in counties.

*** p<0.001, **p<0.01, * p<0.05

Again, we replicate models by each marriage cohort. As predicted by Hypothesis 3, the negative effect of fertility on the satisfaction with family status is more prominent in the younger cohorts than in the older cohorts, and the difference is statistically significant (p<.05).

In sum, the results of ordinal logistic regression consistently show that fertility is negatively associated with women's status in the family and the effects are more prominent for younger

marriage cohorts than for older marriage cohorts with the decline in fertility. Hypotheses 1-3 are all supported.

Fertility Decline and Gender Inequality across Generations

We proceed to examine how sibship size affects educational attainment and occupational achievement in terms of the status of a first job for women as compared to men in the children's generation. Table 4 presents descriptive statistics for selected variables from CGSS2006. We see that both the years of schooling and the status of the first occupation increase across the cohorts, while sibship size declines from 3.5 for those born before 1970 to 1.6 for those born after 1979. Indeed, the percentage of those who are an only child increases from 4.1 percent for the first cohort to 17.1 percent for the third cohort.

Table 4. Means and Standard Deviations for the Sample: Chinese General Social Survey, 2006

	Full Sample	Birth Cohort		
		1949-1970	1971-1978	1979-1988
Years of schooling	7.8	7.0	8.7	9.6
	(4.0)	(4.0)	(3.8)	(3.4)
First occupation ISEI	34.8	33.2	36.5	38.2
	(13.2)	(13.0)	(13.7)	(12.3)
Female (%)	51.7	50.4	54.0	53.8
Sibling configuration				
Sibship size	2.9	3.5	2.5	1.6
	(1.8)	(1.8)	(1.6)	(1.2)
No siblings (%)	7.1	4.1	7.1	17.1
Urban *hukou* origin (%)	21.7	22.0	21.4	20.8
Father's ISEI	29.8	29.6	30.2	30.3
	(13.3)	(13.3)	(13.3)	(13.1)
N (un-weighted)	7,425	4,732	1,539	1,154

Note: Figures in parentheses are standard deviations. Data are weighted.

Table 5 presents the estimated coefficients of the determinants of years of schooling. In Model 1, we include gender, sibship size, father's ISEI, *hukou* origin, and cohort as the independent variables in the models.[9] Results confirm a significant gender gap in schooling. Other things being equal, women still receive about 1.3 fewer years of schooling than men. Having more siblings decreases educational attainment for both men and women. One additional sibling reduces an individual's schooling by 0.24 years; educational attainment increases across time/cohorts. Those who were born in 1971-1978 and 1979-1988 are more educated than those who were born in 1949-1970, by 1.54 years and 2.22 years, respectively. The effects of other control variables are as expected: people with urban *hukou* and children from better socioeconomic backgrounds do enjoy significant advantages in education.

[9] To check the linearity specification for the sibship size effect in Model 1 of Table 6, we fitted a new model, in which sibship size (ranging from 0 to 10) is treated as a set of dummy variables. The F-test statistic for the two nested models is non-significant at .118 with 9/7409 degrees of freedom, suggesting that the linearity specification is acceptable.

Table 5, OLS Regression Coefficients for Models of Educational Attainment, Chinese Men and Women, 2006

	Full Sample		Birth Cohort: 1949-1970		Birth Cohort: 1971-1978		Birth Cohort: 1979-1988	
	Model 1	Model 1a	Model 2	Model 2a	Model 3	Model 3a	Model 4	Model 4a
Female	-1.271***	-0.380*	-1.786***	-1.054***	-0.528*	-0.023	-0.327	-0.242
	(0.106)	(0.190)	(0.126)	(0.277)	(0.247)	(0.425)	(0.283)	(0.424)
Sibship size	- 0.236***	-0.079	-0.166***	-0.061	-0.362***	-0.244*	-0.556***	-0.527***
	(0.033)	(0.042)	(0.037)	(0.053)	(0.068)	(0.097)	(0.116)	(0.134)
Father's ISEI	0.057***	0.057***	0.059***	0.059***	0.061***	0.061***	0.045***	0.045***
	(0.004)	(0.004)	(0.005)	(0.005)	(0.010)	(0.010)	(0.008)	(0.008)
Urban *hukou*	2.491***	2.479***	2.643***	2.634***	1.983***	2.001***	2.296***	2.291***
	(0.154)	(0.155)	(0.174)	(0.175)	(0.340)	(0.346)	(0.283)	(0.284)
Female×Sibship size		-0.303***		-0.210**		-0.203		-0.055
		(0.053)		(0.071)		(0.133)		(0.198)
Birth cohort: 1971-1978	1.537***	1.548***						
	(0.151)	(0.151)						
Birth cohort: 1979-1988	2.216***	2.199***						
	(0.152)	(0.153)						
Constant	6.206***	5.756***	6.132***	5.778***	7.640***	7.362***	8.820***	8.779***
	(0.196)	(0.207)	(0.218)	(0.259)	(0.407)	(0.417)	(0.386)	(0.382)
N	7,425	7,425	4,732	4,732	1,539	1,539	1,154	1,154
R-squared	0.264	0.269	0.221	0.223	0.186	0.188	0.239	0.239

Note: Numbers in parentheses are robust standard errors adjusted for clustering in countries. ***p<0.001, **p<0.01, *p<0.0

The results in Model 1 provide a benchmark for subsequent analyses. In Model 1a, we examine how the effect of sibship size on schooling differs by gender by adding an interaction term. Results show that having more siblings is more detrimental to women's schooling than it is to men's. The non-significant coefficient for the main effect term suggests that the influence of sibship size on schooling is negligible for men, but the significant coefficient of the interaction term indicates a much larger impact on women. Other things being equal, an extra sibling decreases a man's schooling by 0.079 years and a woman's schooling by 0.382 years (0.079+0.303). The difference is statistically significant ($p<0.001$). The evidence lends support to Hypothesis 4, that is, women's disadvantage in education is larger for those with more siblings.

We further break down the sample into three birth cohorts, 1949-1970, 1971-1978, and 1979-1988, and run separate analyses for each cohort. Models 2, 3, and 4 in Table 5 are additive models, confirming the trend in an educational gender gap. There is no significant difference in schooling between men and women in the youngest cohort (1979-1988) which is affected by the one-child policy. The negative effect of sibship size actually increases over time. Other things being equal, an additional sibling decreases schooling by 0.166 years for those born in 1949-1970, 0.362 years for those born in 1971-1978, and 0.556 years for those born in 1979-1988. In an era of low fertility and high child-rearing cost, children from families with high fertility (thus more siblings) might be particularly disadvantaged, but the effects no longer differ between men and women. In Models 2a, 3a, and 4a, we add an interaction term between female and sibship size, and results show that, except for the 1949-1970 cohort, having more siblings does not harm women's educational opportunities in particular. The magnitude of the interaction effect does not vary significantly across cohorts. Hypothesis 6 is not supported.

Finally, we examine gender differences in the effect of sibship size on the status of an individual's first occupation,[10] and the results are shown in Table 6. Model 1 includes female, sibship size, father's occupational ISEI, urban *hukou*, and birth cohort, and Model 1a includes an interaction term

[10] Here we use the status of the first job to avoid the confounding effect of life course. We also tried the status of the current job and obtained the same results.

between gender and sibship size. We do not run these models separately for each cohort as in Table 6, since gender difference in the effect of sibship size does not vary by cohort.[11]

Similar to what was observed for educational attainment, the status of a woman's first occupation tends to be lower than that of a man's first occupation, by 2.308 points, other things being equal. Those with more siblings are also more disadvantaged, and an additional sibling reduces the occupational status by 0.243 points. The statistically significant coefficient for the interaction term between gender and sibship size suggests that women with more siblings are even more disadvantaged in occupational status attainment compared to men ($p<.001$). This result is consistent with Hypothesis 5.

[11] Results are available upon requests.

Table 6. OLS Regression Coefficients for Models of Status of First Occupation, Chinese Adults, 2006 (N=7,425)

	Without Years of Schooling		Controlling for Years of Schooling	
	Model 1	Model 1a	Model 2	Model 2a
Female	-2.308***	-0.349	-0.457	0.203
	(0.357)	(0.633)	(0.324)	(0.588)
Sibship size	-0.243*	0.102	0.100	0.216
	(0.102)	(0.149)	(0.098)	(0.142)
Father's ISEI	0.210***	0.210***	0.127***	0.128***
	(0.018)	(0.018)	(0.017)	(0.017)
Urban *hukou*	5.956***	5.930***	2.329***	2.333***
	(0.490)	(0.491)	(0.484)	(0.484)
Birth cohort:				
1971-1978	3.049***	3.074***	0.812	0.828
	(0.495)	(0.495)	(0.424)	(0.424)
1979-1988	4.477***	4.439***	1.250*	1.248*
	(0.561)	(0.562)	(0.553)	(0.553)
Female×Sibship size		-0.667***		-0.227
		(0.172)		(0.169)
Years of schooling			1.456***	1.451***
			(0.057)	(0.057)
Constant	27.75***	26.76***	19.34***	19.00***
	(0.762)	(0.822)	(0.767)	(0.831)
R-squared	0.148	0.150	0.292	0.292

Notes: Numbers in parentheses are robust standard errors adjusted for clustering in counties. Data are weighted. *** p<0.001, **p<0.01, * p<0.05.

Note that in the models above, we did not include education as an independent variable. Once the years of schooling is controlled for in Models 2 and 2a, the effects of gender, sibship size, and their interaction terms all become insignificant, but education becomes a strong predictor of occupational attainment, as suggested by the classic Blau and Duncan status attainment models (Blau and Duncan 1967). Therefore, we can conclude that China's fertility decline and the resulting small sibship size has had direct effects on changing gender inequality in education, whereas

gender inequality in occupational attainment is largely due to the effect of education. Women who were born into families with more siblings tended to be less educated, and consequently, were more likely to start in a first job of lower-status.

DISCUSSION AND CONCLUSION

In this paper, we elucidate the complicated and dynamic pathways through which the process of women's empowerment and fertility decline enhance each other. We highlight the impact of fertility reduction on the empowerment of women in two ways. First, giving birth/child rearing may affect women's status within marriage and family. Having few children would relieve women from housework and devoted more effort on career advancement. Second, the small sibship size resulting from fertility decline enhances girls' education, thus contributing to the reduction of educational gender inequality in their daughters' generation. In both pathways, marriage and family serve as important agents in resource allocation (between women and their husbands and between sons and daughters) in the context of fertility decline.

Given the fact that fertility decline in China since the 1970s largely resulted from state policy intervention rather than women's empowerment, this paper focuses on how fertility decline leads to the improvement of women's status both within and outside of their families in China. Results from two national representative surveys conducted in 2000 and 2006 show that women with lower fertility perform less housework and also tend to be more satisfied with their status within the family than women with higher fertility. Such effects are more pronounced for women in more recent marital cohorts. Across generations, lower fertility implies fewer siblings for the next generation and daughters tend to benefit more in terms of years of schooling and subsequently the status of their first occupations. The gender gap in educational attainment is negligible for the youngest cohort born after the implementation of the one-child policy since 1979. After taking into account the effect of education, we found no significant gender gap in occupational status attainment.

From the development policy perspective, investments in women and the promotion of gender equality are effective methods of controlling population growth in developing countries. On the other hand, as we see in China, reduced fertility also has the effect of enhancing women's status in marriages and the families, and girls with fewer siblings tend to benefit more in terms of schooling and subsequently in occupational attainment. Perhaps these are just a few of the many important

but unintended consequences of fertility decline in China as well as in many other developing countries.

To address the consequences of fertility decline on the empowerment of women, analyses of existing cross-sectional data have several limitations. First, while we focus on women's status as the outcomes, indicated by the share of housework and perceived status within family, and education and employment in the society, women's power/autonomy relative to men's is a broad term that needs better measures at the micro-level in relation to their decisions on child births (e.g., Safilos-Rothshild 1982). Second, the impact of child births on women's status may be endogenous in two respects. A wife with more power relative to her husband may do less housework, be more satisfied with her status and also have more autonomy in making decisions on child births. Parents with higher expectations on their children's education may also limit their births, known as the "Endogenous Quality-Quantity Tradeoff" (Becker and Lewis 1973; Steelman et al. 2002). Before better data and more rigorous identification strategies become available, we should be cautious to treat the relationship between fertility and women's status as causal. Moreover, our analytical framework presumes no change with respect to women's status in the domestic sphere, and having fewer children can relieve women of household burden and contribute to their career development in the markets. While this is a reasonable assumption, fertility decline might also play a role in ultimately affecting the gender norms and empowering women in the long run, as women's socioeconomic status improves. Finally, the paper has no evidence to link a woman's status within the family and her labor market status, as outlined in the analytic framework. Future research is expected to fill this void with empirical data from China.

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