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Does the family planning program affect fertility preferences? The case of China

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Abstract
An extensive literature review suggests a clear decline trend in women's ideal family size in China in the past three decades, from on average three children in the 1970s to less than two by the late 1990s, but little change in son preference. Drawing on data of a nationwide survey, this paper reveals that most women still preferred two children in 2001, despite the decade-long implementation of one-child policy. Meanwhile, once a woman stated a one-child preference, no clear son preference was observed. It was found that women in areas with strong birth control program and developed economy tended to prefer fewer children, while younger, more educated women living in urban cities showed the same trends.

Using logistic regression model, this paper shows the significant effects of ideal family size on actual fertility after controlling women's socio-economic characteristics and regional variation in birth control program. Using the Cox partial likelihood method, this paper further suggests that both the ideal family size and the sex of the first baby had significant effects on the relative hazard of a woman moving from one to a second child. It is a difficult task to separate the different effects on the decline of ideal family size between the birth control program and socio-economic development. However, it is suggested that the birth control program probably pushed the son preference apparent in behaviour given its strict restriction on the number of children.

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World fertility declined steadily during the past half century. The experiences from most countries suggested that a declining desired family size was one of the principal forces driving fertility transition (Bongaarts 2001). In the developing world the effective family panning programs largely contributed to the decline of fertility. But there was no conclusive evidence whether the family planning program also brought down the popular fertility preferences (Freedman 1997). This inquiry is important in practice because an effective program, which has successfully altered the popular fertility preference, will encounter less moral and social costs in birth control.

The experiences of China offer a unique opportunity to answer this question for several reasons. First, China has a strong family planning program since the early 1970s. From the starting point, the Chinese birth control program has restlessly promoted the ideas such as "having fewer births and healthy births" (*shaosheng yousheng*), and "girls and boys are the same" (*nahai nvhai dou yiyang*). After 1979, the program further advocated the one-child family norm (Greenhalgh 2003). Second, the pace of fertility decline during the past three decades was very quick and unprecedented (Coale and Chen 1987; Feeney et al. 1989; Gu 1996). Despite the controversy over the actual fertility levels over the course of 1990s, it is certain that fertility fell quickly and went below replacement level (CPIRC Research Group 2003; Zhang 2004). Meanwhile, China has experienced a rapid socio-economic development since the late 1970s, which also contributes to the changes in fertility preferences but makes it difficult for the attempt to identify programmatic effects.

Two concerns were often raised about the research on fertility preference. One concern is general about the after-the-fact rationalization. Because the information of fertility preferences came from retrospective surveys in most cases, presumably the answers given by women at the time of survey could be affected by *ex post* rationalization, i.e. women's unwilling to admit unwanted births. Nevertheless, a number of detailed studies suggested that responses of fertility preference were meaningful and deserved serious consideration (United Nations 1987). Moreover, the practice of analyses restricting responses to younger married women approved helpful in reducing the effect of the after-the-fact rationalization of existing number of children (Knodel et al. 1996). The other concern is specific to China. It was suspected that Chinese women could understate their fertility preference by giving "political correct" answers, due to the government pressure from the one-child policy (Hermalin and Liu 1990). However, a number of surveys at provincial levels and careful case studies at local levels suggested this was not the case, because few women stated their preference for the officially advocated one child only, but "unwisely" insisted one child being for each sex (see, for example, Whyte and Gu 1987; Greenhalgh 1994; Feng and Zhang 2002).

In the absence of uniform national figures on fertility preferences, there has been no research in this aspect until recently. Two recent nationwide retrospective surveys conducted by the State Family Planning Commission (SFPC) of China in 1997 and 2001 included questions about fertility preferences. In addition, they also provide plenty of information about women's marriage, childbearing and contraception histories. Drawing on the newly available data, this research tries to examine whether the family planning program contributed to the changes in fertility preferences.

After briefly introducing the data and methodology, the paper first reviews the changes in deal family size over the past three decades, and then looks closely at changes in the second half of 1990s. Using a logistic model, it examines the relationship between the ideal family size and actual fertility after controlling socio-economic factors and regional variation in birth control

program. It further examines the relationship between the ideal family size, the son preference and actual fertility. In the end, it offers explanations for the changes in fertility preferences, trying to identify the role of underlying causes from the family planning program.

The decline trends of family size preference since 1970s

There were very limited sources on fertility preferences in the 1970s. The 1982 one-per-thousand survey suggested that an ordinary Chinese woman would have on average six children in her reproductive career by 1970. The dramatic fertility decline in the 1970s was accompanied by reduced ideal family size. One research suggested that the modal Chinese peasant probably wanted two sons and a daughter in the 1970s (Parish and Whyte 1978).

There was evidence indicating that the mean desired number of children declined from three children to a bit more than two as early the first half of 1980s. Based on a series of local surveys in the first half of 1980s, Whyte and Gu (1987) estimated that the average ideal family size for rural peasants was 1.96, after comparing results from surveys in rural areas of nine provinces from 1982 to 1985. Meanwhile, the average desired number of children for urbanites was 1.58 according to six surveys in cities from 1983 to 1985. More importantly, they discovered that most people still preferred the traditional Chinese norm of "complete family with one son and one daughter" (*ernu shuangquan*), rather than the traditional large family or official advocated one child only. Nonetheless, they argued that the actual ideal family size would be a bit higher than two children (Whyte and Gu 1987: 478):

> It would be misleading, then, to conclude that the modal family size preference, as revealed in China survey data, is two children. Given this sort of underlying preference, a considerable number of families with two daughters or two sons could be expected to continue bearing children, if the family planning program did not inhibit them from doing so.

From 1985 to 1987, the SSB in collaboration with the International Statistical Institute (ISI) conducted a two-phase In-Depth Fertility Surveys (IDFS), the Chinese version of World Fertility Survey (WFS), in 7 provinces and 2 municipalities. These series of surveys provided detailed information of fertility preferences in the second half of 1980s. The IDFS Survey (Phase-1) in 1985 reported that the average desired number of children was 1.6 in Shanghai, 2.2 in Hebei province and 2.5 in Shannxi province under current birth control policy, respectively (Hermalin and Liu 1990; Wang 1996). The IDFS Survey (Phase-II) in other seven provinces reported that the ideal family size for women at first marriage was 1.7 in Beijing, 1.9 in Liaoning, 2.1 in Shandong, 2.9 in Guangdong, 3.1 in Guizhou, and 2.8 in Gansu under the current birth control policy. With the assumption of lifing current birth control policy, the desired number of children increased a bit, from 2.0 in Beijing to 2.2 in Liaoning, 2.5 in Shandong, 3.2 in Guangdong, 3.6 in Guizhou and to 3.2 in Gansu in 1987, respectively (International Statistical Institute 1991).

Using the data of the In-Depth Fertility Survey in Hebei and Shannxi province, Wang (1996) reported that most people, about 60%, preferred two children, regardless of residence, educational attainment, or whether they had already made a commitment to the one-child policy by signing the one-child certificate. Meanwhile, around 20% women still desired three or more children. He further found that the desired number of children was statistically significant in

association with the acceptance of one-child certificate, and the likelihood of continuing to have a second child.

Until 1990, it was suggested that the mean desired number of children was still above two children per family. For example, Zeng (1997) compared the actual fertility levels in 1990 with the policy-ideal fertility at the provincial level. He reported that the actual fertility of 2.31 in 1990 was 42.6% higher than the policy ideal fertility, indicating the unsuccessful policy implementation in the 1990s. Nonetheless, a number of field studies and surveys suggested important changes in fertility preferences occurred since the early 1990s.

In 1992, the Population Institute of the Chinese Social Science Academy (CSSA) conducted a sample survey in 10 provinces and cities to investigate fertility preference (hereafter the 1992 CSSA survey) (Tian 1995). Interestingly, about 59% wives did not have clear ideal family size before childbearing. For those having clear preference, the average ideal family size was 1.65 for urban wives and 1.89 for rural wives in 1992. The preference after childbearing was measured by women's judgment of their achieved children number. It was reported that about 36% urban households and 44% rural households with one child only complained that the number of children was "not enough". Meanwhile, 89% urban families and 87% rural families with two children were satisfied with their achieved number of children. In addition, 43% urban families and 23% rural families with three children considered children "too many" (Shao 1999). For the information available, this was the first time that the reported ideal family size fallen below two children.

In two consecutive field studies conducted in rural villages of Shannxi province in 1988 and 1993, respectively, Greenhalgh and her colleagues described the subtle but important changes in fertility preferences (Greenhalgh 1994; Greenhalgh, Zhu, and Li 1994). It was reported that in the late 1980s villagers considered necessary to raise two children, the best being one son and one daughter, though more than two were still acceptable. However, by 1993 they probably still preferred two children, but with growing emphasis one daughters. While villagers managed to avoid having three children or two sons, some of them would adapt to the fact of having two daughters. Another local studies also confirmed such a change in fertility preference. Choe and Tsuya (1991) reported that the ideal family size of female peasants aged 15-59 in Jilin province was 1.95 in a 1985 Survey on Rural Fertility and Living Standards. Ten years later, another survey in the same areas suggested that the deal family size declined to 1.6 for women in rural Jilin (Zhou, Guan, and Li 1997).

By the late 1990s, the enquiry of fertility preference had attracted more attention and was included into nationwide representative surveys. The 1997 SFPC survey included a question of fertility preference for the first time. According to this survey, 61.5% rural women and 51.5% urban women preferred two children, while 25.l% rural women and 42.2% urban women considered one child as ideal family size. The average number of desired children was 1.77 in 1997, with 1.83 in rural areas vs. 1.58 in rural areas. Following the 1997 survey, the 2001 SFPC survey also enquired female respondents on the ideal number of children and the respective sex composition. The reported ideal family size at the national level was 1.78, with 1.88 in rural areas vs. 1.50 in urban areas.

The most recent available evidence is from an independent survey in 2002. This was a survey on people's marriage and childbearing preference in 16 provinces conducted by the Beijing Zero Information Consulting Co. Ltd, sponsored by the SFPC Department of Information, Education and Communication. It reported that the average ideal family size of respondents aged 16-70 in

2002 was 1.78 under the circumstance of current birth control policy, and 2.04 under the condition without current birth control policy (Chen and Zhang 2003). This finding is consistent with those from the 1997 and 2001 SFPC surveys, offering corroborative evidence of continued decline in ideal family size during the late 1990s.

Table 1 summarizes the reported ideal family size in previous studies, which basically consists of a time series of decline trends in ideal family size, despite their being representative at different levels.

Table 1 Changing Ideal Family Size from the 1970s to the late 1990s

Time	Location	Ideal family size	Sources
1970s	Rural areas	3 [1]	Parish & Whyte (1978)
Early 1980s	9 provinces	2 [2]	Whyte & Gu (1987)
Mid-1980s	9 provinces	1.9-3.6	ISI (1991), Wang (1996)
1988-1993	Rural Shannxi	around 2	Greenhalgh (1994)
1992	10 provinces	1.8	CSSA (1995)
1997	Nationwide	1.77	SFPC (2000)
2001	Nationwide	1.70	Own calculations
2002	16 provinces	1.66[3]	Chen & Zhang (2002)

Note: 1. Three children meaning two sons and one daughter.

2. Two children meaning one son and one daughter.

3. Own calculations based on the survey tabulations, limited to people aged 15-49.

Data and Methodology

The data used in this research came from two nationwide representative retrospective surveys conducted in 1997 and 2001 respectively. Both surveys used the stratified, three-stage cluster and proportional probability sampling approach and roughly the same sampling frame, covering about 180, 000 persons in sample households. In the 1997 survey, using all the women of reproductive ages in sample households as a new sampling frame, each province sampled women aged 15-49 based on the proportion of women at the province from the whole country. As a result, 15, 213 women were randomly chosen being interviewed about their lifetime pregnancy histories. In the 2001 survey, every woman at reproductive age in sampled households was interviewed. The sample size at household level was 177, 610 persons in all provinces in the mainland of China. Then the survey actually interviewed 39, 586 women. Compared to the 1997 survey, the enlarged sample size means a reduced degree of sampling variation.

Both the 1997 and 2001 surveys have only one question about fertility preference. Although similar in wording, it was different to fill the questionnaire, which might produce slight difference. The question in the 1997 survey was “what do you think is the ideal number of children for a family? And how about the sex composition?” The questionnaire gave a number of options, but the interviewers were asked to fill the questionnaire according to respondents’

answers. The question in 2001 was: "How many children do you think are ideal for a family?" After the respondent gave the answer, the interviewers asked the respondents to specify the sex composition. As mentioned earlier, the two surveys used roughly the same sampling frames and sample size. Although they did not constitute panel data, it is still meaningful to examine the trends between two surveys.

Looking closely into changes in ideal family size in the late 1990s

Table 2 shows the ideal family size of married women by 5-year age group reported in the 1997 and 2001 surveys. The cohort shift of fertility preference was obvious. The younger the women, the fewer the desired number of children they indicated. Women aged 45-49 desired 12% more children in 1997 than women aged 20-24 and 20% more children in 2001. It is very interesting to notice that women aged above 34 desired same number of children in 1997 and 2001. In both surveys, the proportion of women who preferred two children was higher among older age groups. But in any cohort, very small proportion of women indicated that they wanted to have no children, while small amount of women preferred three and more children. Table 2 did not include younger women aged 15-19, because many of them were still in school and most of them had not get married and probably did not have clear fertility preference.

Table 2 Percentage distribution and means of ideal family size of married women by 5-year age group, China, 1997 and 2001

Age group	Ideal family size (1997)					Ideal family size (2001)				
	No children	One child	Two children	Three children+	Means	No children	One child	Two children	Three children+	Means
20-24	1.3	43.4	51.5	3.8	1.63	0.3	47.9	48.3	3.5	1.48
25-29	0.6	33.2	61.6	4.6	1.71	0.5	41.0	54.3	4.2	1.62
30-34	0.5	27.5	66.2	5.8	1.77	0.8	32.9	61.2	5.1	1.72
35-39	0.6	27.4	65.8	6.2	1.78	0.8	29.7	62.3	7.2	1.78
40-44	0.3	22.9	70.3	6.5	1.83	1.0	29.1	60.7	9.2	1.82
45-49	0.3	22.1	68.8	8.8	1.86	0.8	24.8	64.4	9.9	1.87

Source: Own calculations based on 1997 and 2001 surveys.

Note: Due to fewer cases of urban women having more than two children, they were added to those with two children.

Table 3 presents the means and percentage distributions of the desired number of children as stated in the 1997 and 2001 survey, including responses both for all currently married women and for married women younger than the age of 30. It was believed that younger women were less likely to have exceeded already their ideal number of children, and such a restriction to some extent would reduce the after-the-fact rationalization as suggested by Knodel and his colleagues (1996: 309). It was also suggested that the responses of younger women should represent a more recent reflections of fertility preferences. As can be seen, the mean number of desired children for all married women was 1.77 in 1997 and 1.73 in 2001, meanwhile, the figure was a bit lower for younger married women, e.g. 1.70 in 1997 and 1.61 in 2001, respectively. In each survey, the majority of women in both groups expressed a two-child family size preference, while a small

proportion preferring three children or more and very small proportion desiring no children. Moreover, both surveys illustrated that the average ideal family size had been kept below two children in the second half of 1990s, following a gradual but constant decline in the preceding decades. Furthermore, both surveys suggested a slight decline of ideal family size during the four-year period of two surveys.

Table 3 Percentage distributions and means of the desired number of children of married women, China, 1997-2001

Respondents/ Desired number	1997 survey (N=11, 750)	2001 survey (N=32, 797)
Married women aged 20-49		
0	0.4	0.8
1	28.0	32.6
2	65.5	59.9
3+	6.1	6.7
Total	100	100
Mean	(1.77)	(1.73)
Married women 20-29	(N=4, 018)	(N=9, 144)
0	0.4	0.5
1	34.1	42.1
2	60.8	53.4
3+	4.8	3.9
Total	100	100
Mean	(1.70)	(1.61)

Source: Own calculations based on the 1997 and 2001 SFPC surveys.

Note: All surveys refer to currently married women; all non-numerical responses are excluded.

While there was an obvious trend of two-child preference both for all women and for younger women in 1997 and 2001 respectively, an important shift in distribution of responses can also be identified. For all married women, less than 30% married women preferred one child and 65.5% desired two children in 1997, while about one-third women stated preference less than two children and 60% desired two children by 2001. For younger married women, a little more than one-third of them preferred one child and 61% preferred two children in 1997, but 42% favored one child and 53% desired two children by 2001. Compared to more than 90% rural women preferred two children and above, as reported in the IDFS Survey in Hebei and Shannxi province in 1985 (Wang 1996), this was certainly an remarkable decline for a 15-year period. The slight decline of ideal family size consists of increase of more preference of one child only and decline in preferred two or more children. Apparently, both in 1997 and 2001, there were less older married women who preferred two and more children compared to all married women. It is probably due to some older women with two or children rationalized their extant number of children.

Table 4 Mean desired number of children and percentage of married women by residence type and educational achievement, China, 1997-2001

Respondents/	Mean desired number of children		Desired one child		Desired two children		Desired more than two	
desired number	1997	2001	1997	2001	1997	2001	1997	2001
Married women aged 20-49	(N=11, 750)	(N=32, 797)						
Residence type								
Urban	1.58	1.46	41.3	50.6	54.6	45.6	2.6	1.5
Rural	1.83	1.81	23.9	26.7	68.8	64.6	7.2	8.4
Educational level								
Without schooling	1.93	1.96	17.3	17.4	72.3	72.7	10.4	9.5
Primary school	1.83	1.83	23.7	25.2	69.6	65.8	6.6	8.8
Secondary school	1.68	1.62	35.3	40.1	60.3	56.1	3.9	3.1
High school above	1.60	1.46	39.4	50.3	56.5	45.9	2.6	1.3
Total	(1.77)	(1.73)						
Married women 20-29	(N=4, 018)	(N=9, 144)						
Residence type								
Urban	1.50	1.38	49.3	60.9	46.8	36.3	2.5	1.1
Rural	1.75	1.67	30.5	38.2	64.1	57	5.3	4.7
Educational level								
Without schooling	1.91	1.94	17.7	18.3	73	71.2	9.1	10
Primary school	1.77	1.75	28.1	30.4	66.3	64.4	5.6	5.1
Secondary school	1.61	1.51	41	50.3	55	47.8	3.3	1.6
High school above	1.51	1.34	48.9	64.7	48.3	32.6	1.9	0.9
Total	(1.70)	(1.61)						

Source: Own calculations based on the 1997 and 2001 SFPC surveys.

Note: All surveys refer to currently married women; all non-numerical responses are excluded.

Table 4 further illustrates an association between ideal family size preference and women's residence and educational achievement in two surveys. In general, the ideal family size of urban women was lower than their rural counterparts. For all married women, rural women desired 0.25 more children than urban women in 1997, and 0.35 children in 2001. This difference was roughly the same for younger married women. The one-child norm seemed more accepted by urban women, but two-child preference was more popular among women in both areas. By the year 2001, for example, one half of all married urban women indicated to have one child only, but 46% desired two children. Meanwhile, for rural married women, less than 30% expressed preference for one child only, but about 65% women preferred two children.

Obviously, the desired number of children has a negative relationship with women's educational achievement. The higher the educational level, the lower the desired number of children. For example, for younger married women, the desired number of children for women without schooling was above 1.9 in 1997 and 2001, but was less than 1.6 for the groups of women with

educational achievement of secondary school and above. In addition, for both groups of women, the decline in mean desired number of children was more obvious among women with more education, e.g. with educational achievement of secondary school and above, from 1997 to 2001. It appears that there was no significant change of family size preference both for all women and young women without schooling. However, while most women still preferred two children, a small proportion of increase in desiring three children and increase in proportion of those favoring one child in other groups with higher educational achievement.

Table 5 Mean desired number of children and percentage of married women by ethnic groups and regions, China, 1997-2001

Respondents/	Mean desired number of children		Desired one child		Desired two children		Desired more than two children	
desired number	1997	2001	1997	2001	1997	2001	1997	2001
Married women aged 20-49	(N=11, 750)	(N=32, 797)						
Ethnic groups								
Han majority	1.76	1.70	28.8	33.9	65.1	60.0	5.6	5.4
Minority	1.92	1.99	19.3	20.3	69.5	69.9	11.1	9.8
Regions								
Advanced	1.64	1.53	39.1	45.6	56.4	52.2	4.1	1.1
Middling	1.84	1.82	21.6	25.7	71.4	65.4	6.6	8.4
Backward	2.02	1.98	10.4	19.4	76.0	64.9	13.2	14.9
Total	(1.77)	(1.73)						
Married women 20-29	(N=4, 018)	(N=9, 144)						
Ethnic groups								
Han majority	1.68	1.55	35.4	45.8	59.8	51.6	4.4	2.2
Minority	1.86	1.94	21.9	22.5	70.0	70.3	8.1	6.9
Regions								
Advanced	1.54	1.39	49.1	61.3	47.3	37.9	3.3	0.2
Middling	1.77	1.66	27.4	37.4	67.4	58.9	4.8	3.0
Backward	1.98	1.96	10.9	17.7	78.8	69.8	9.8	12.0
Total	(1.70)	(1.61)						

Source: Own calculations based on the 1997 and 2001 SFPC surveys.

Note: All surveys refer to currently married women; all non-numerical responses are excluded.

Table 5 shows difference in women's ideal family size according to ethnic groups and SFPC three-category of regions in birth control, illustrating the association between women's ideal family size and the birth control program. Basically, minority women were largely exempt from the birth control program. Meanwhile, women in areas with stronger birth control program would be more affected by the program compared to women in areas with more lenient program performance. As expected, women of Han majority tended to have a smaller ideal family size than women of ethnic minority, which was more obvious among younger married women. For example, the mean desired number of children for younger Han women was 1.68 in 1997 and 1.55 in 2001, while the figure for younger minority women was 1.86 in 1997 and 1.94 in 2001,

respectively. Similarly, there was smaller proportion of younger minority women preferred one child but more of them favoring two children compared to younger Han women in 1997 and 2001.

The difference in family size preference of women in different regions was very apparent. Both for all women and for younger women, those in living in "advanced" areas tended to have fewer desired number of children than those in "middling" and "backward" areas. The differences between two extremes are very outstanding. For example, even for all women, less than half women in "advanced" areas preferred one child in 1997, while more than 80% women in "backward" areas desired two children or more. Except in "backward" areas, only a small proportion of women preferred three or more children. It seems reasonable that the birth control program affected women's ideal family size. Certainly, "advanced" areas in birth control were also areas with higher level of socio-economic development. In the following section, the multivariate analysis approach is applied to further examine the relationship between ideal family size and actual fertility after controlling these socio-economic variables and regional factors.

The above analyses illustrate the similar trend and distribution of ideal family size between all married women and younger married women. Despite some extent of *ex post* rationalization, it appears that the analyses including of all women were meaningful. Thus, the following analyses refer to all married women except stated otherwise. Table 6 presents the ideal family size of women who had at least one surviving child by the number of their children. Since the birth control program is strongly parity-oriented, it is expected that the number of children of a woman already had could affect her response to the enquiry of family size preference. Similarly, the inclusion of women without children could also bias the reported fertility preference.

Table 6 Percentage distribution and means of ideal family size by the number of children ever born of women, China, 1997 and 2001

Residence/number of living children	Ideal family size (1997)				Ideal family size (2001)			
	One child	Two children	Three children+	Means	One child	Two children	Three children+	Means
Rural areas								
1	38.3	57.5	4.0	1.7	45.1	53.2	1.4	1.6
2	15.9	77.8	6.1	1.9	16.4	78.2	5.2	1.9
3+	12.8	74.4	12.8	2.0	11.8	70.6	17.4	2.2
Person's R		.252***				.387***		
Urban areas*								
1	45.0	51.0	2.2	1.5	56.7	40.4	0.5	1.4
2+	23.3	73.2	3.1	1.8	25.3	69.2	0.4	1.7
Person's R		.147***				.253***		

Source: Own calculations based on 1997 and 2001 surveys.

Note: Due to very few cases of urban women having more than two children, they were added to those with two children.

As can be seen, the number of surviving children to a woman was associated with her desired number of children. But this association seemed stronger in 2001 compared to that in 1997, with the person's R 0.387 vs. 0.252 in rural areas and 0.253 vs. 0.147 in urban areas ($P<0.005$). For rural women, about 57.5% women with one child desired two children in 1997, still 53% women with one child preferred two children in 2001, although 45% of them stated preference for one

child only. For those who had two or more children, the majority of them, more than 70% of them desired two children. In urban areas, only 45% women with one child preferred one child in 1997, but about 57% of them considered one child as ideal family size in 2001. For those who had two children or more, at least 70% of them desired two children both in 1997 and 2001.

In general, the 1997 and 2001 surveys confirmed that the ideal family size of women declined to below two children. In addition, the two surveys indicated a slight but significant decline in the mean desired number of children. Moreover, it was found that there was a negative relationship between women's ideal family size and their socio-economic characteristics and the strength of the birth control program. While the preference for two children was still popular in the late 1990s, the most important feature was the downward shift in the proportion of those favoring three or children, compared to women around the mid-1980s (see, for example, Wang 1996). All these findings suggested a narrower gap between the state restriction on the number of children a couple is allowed to bear and the public acceptance.

Until recently, many Chinese officials and demographers still argued that the strict birth control policy can not be eased because the popular ideal family size was still higher than the state demands. However, the experiences of other countries with below replacement fertility, including Australian, Japan, The Republic of Korea and Thailand, suggest that fertility preference probably was not a good predicator for very low fertility, because most people in these countries still preferred around two children (Knodel et al. 1996; McDonald 1998; Ogawa 2003; Choe, Retherford, and Kim 2004). Given the program strengthening after 1991, it seemed more feasible that the birth control program further brought the fertility levels down as expected.

The effects of women's ideal family size on their actual fertility

In the absence of information of ideal family size in a nationwide representative survey, there has been no research available that directly examined the relationship between ideal family size and actual fertility. This section attempts to fill this gap drawing on the plenty of information from the 1997 and 2001 survey. For the purpose of this analysis, women without children were excluded from the dataset. In order to refect the influences from the birth control program, only women who had their either first order or second order births after 1980 were included, when the one-child policy was actually taken effect.

To examine the influences of women's ideal family size, while controlling their demographic and socio-economic characteristics, a multivariate statistical approach is applied based on the 1997 and 2001 survey data. As the birth control program is parity-oriented and the program promoted one-child norm, it is of great interest to examine the determinants of women with one surviving child to continue to have another or more children. Therefore, a logistic regression model is suitable to this purpose. For binary response variables, the logistic regression model describes how the probability of a particular category depends on the values of independent variables. It can be expressed as the following formula:

$$Log\ (P/1-P)=\alpha+\beta X \qquad (1)$$

where the ***P*** is the predicted probability of dependent variable according to the values of independent variables. The ***(P/1-P)*** is the relative risk, or the odds. While the α is the constant, the value at which the line intersects the Y axis; the β is regression coefficient, which represents the change in Y for each increase or decrease in *X*.

In the following models, the dependent variable was whether a woman continued to have more than one child. Accordingly, all women with at least one surviving child were classified as 0 if having one child only, or as 1 if having two or more children. The primary independent variable was women's ideal family size. It was hypothesized that the more children a woman desired, the more children she was likely to have actually. The controlling independent variables include: (1) residence type, it was expected that urban women was less likely than rural to have more children; (2) ethnic group, as ethnic minority women were more likely to have more children than Han women; (3) educational achievement, it was expected that educational achievement was negative to the number of children ever born; (4) women's age, as shown in the preceding section, older women tended to have more children; (5) age at first marriage, it was suggested that the earlier a woman got married, the more likely she had more children; (6) sex of first child, it was expected that a woman was more likely to continue to have a second or more children if the first was a girl; and (6) regional factors, as the SFPC classification of "three category" region reflected the level of socio-economic development and program performance of birth control, it is hypothesized that women in "backward" areas were more likely than women in "advanced" and "middling" areas to have more children. Table 7 presents the estimated coefficients and odds ratios of logistic regression models on the effects of ideal family size on actual fertility in 1997 and 2001.

It was found that the ideal family size of a woman with one surviving child is statistically significant in affecting the likelihood of her continuing to have more children. The more the desired number of children of a woman, the more children a woman would actually have. In 1997, the increase of one more child in the ideal family size of a woman doubled the likelihood to have another child, after controlling her socio-economic, demographic characteristics and regional factors, while in 2001 it would tripled the likelihood. This was probably due to the decline both in ideal family size and in actual fertility during the four-year period. It strongly supports the argument that women's ideal family size, or the desired number of children, greatly affects their actual fertility.

As expected, rural women were more likely to have more children compared to urban women, after having one child. This was certainly related to the strictness of program performance in urban areas. Interestingly, ethnicity was not a statistically significant explanatory variable. Despite the fact that minority women tended to have more desired number of children and more children actually than Han majority women, other factors played more important roles in affecting their actual fertility.

Table 7 Coefficients and Odds Ratios of Logistic Regression Model of the Effects of Ideal Family Size on Fertility, China, 1997 and 2001

	1997 survey (N=8, 063)		2001 survey (N=25, 712)	
Variables	Coefficient	Exp (B)	Coefficient	Exp (B)
Residence type (Ref=urban)				
Rural	2.407***	11.103	2.157***	8.649
Ethnicity (Ref=Minority)				
Han majority	N.S.	N.S	N.S.	N.S
Educational level (Ref=high school +)				
No schooling	1.326***	3.764	1.517***	4.561
Primary school	0.937***	2.551	1.243***	3.467
Secondary school	.654***	1.923	0.817***	2.263
Ideal Family size	.772***	2.165	1.165***	3.207
Women's age	.354***	1.425	0.279***	1.322
Age at first marriage	-0.452***	0.636	-0.364***	0.695
Sex of first baby (Ref=boy)	.795***	2.215	1.056***	2.875
Regional difference (Ref=Backward areas)				
Advanced areas	-1.789***	0.167	-2.024***	0.132
Middling areas	-.449***	0.638	-0.583***	0.558
Constant	-5.053***		-5.623***	
-2 Log Likelihood	11126.36		19540.98	
Cox & Snell - R^2	0.445		0.464	
Nagelkerke - R^2	0.595		0.620	

Source: Logistic regression model run on the 1997 and 2001 survey data.

Note: 1. Excluded cases of women without children and with missing values.

2. *** significant at the level P<0.005. N.S. not significant.

The statistical analysis confirms the hypothesis that the female educational achievement was negative to their actual fertility. Compared to women educated at high school or above, women without schooling was much more likely to continue to have more children, three times the probability in 1997 and four times in 2001. Meanwhile, women with primary and secondary school education were also very more likely to continue to have more children.

The cohort shift was obvious in terms of the effects of ideal family size on actual fertility. The older a woman, the more likely she would have more children. After having the first child, one year increase in age means actually 30-40% more chances to have more children both in 1997 and 2001. Meanwhile, it was found that women's age at first marriage was a statistically significant covariate for actual fertility. An early marriage suggested a more probability for a woman to have early childbearing and hence to have more children. Undoubtedly, the late marriage would greatly reduce the probability to have more children.

After controlling other covariates, the sex of first baby was statistically significant affecting the probability to continue to have children. Among women with at least one surviving child, if the first was a male, the mother was less likely to continue to have additional children; but if the first

was a girl, the mother had two times higher probability to have more children in the late 1990s. This suggests that in addition to women's desired number of children, the sex composition of children was equally important in affecting their reproductive decision.

As a variable reflecting regional differences both in socio-economic development and birth control performance, the variable of regional difference was found statistically significant. The likelihood of women in "advanced" areas to have more children was 13-17% of their counterparts in "backward" areas in the late 1990s. Meanwhile, women in "middling" areas had 56-64% probability to have more children of those women in "backward" areas.

In general, it was found that the probability of a woman to have more than one child was affected by a number of socio-economic, demographic, regional and programmatic factors. Nonetheless, other things being equal, the ideal family size of a woman significantly affected her actual fertility. Consequently, the reduction in the mean desired number of children over time made contributions to the fertility decline in the 1990s.

The evidence of son preference in previous studies and in the 2001 survey

Numerous studies suggested that the sex composition was equally important as ideal family size in China (e.g. Greenhalgh and Winckler 2001; Croll, Davin, and Kane 1985; Whyte and Gu 1987; Greenhalgh 1993). It was widely considered that the son preference was strong in China given its deeply rooted socio-cultural meaning. Nonetheless, both the In-Depth Fertility Survey at provincial levels in the 1980s and the two recent SFPC nationwide surveys in the late 1990s failed to provide direct evidence of son preference in respondents stated fertility preferences. On the contrary, all of them suggested a two-child preference and a balance of one child of each sex.

However, on the side of behavior, a number of surveys provided strong evidence of son preference. For example, Arnold and Liu (1986) revealed the relationship between the sex of preceding child and the fertility and contraceptive behavior based on the 1982 one-per-thousand survey. It was suspected that the son preference was closely associated with the increasingly rising sex ratio at births in recent two decades. Poston and his colleagues (1997) used the 1988 two-per-thousand survey data to explore such a relationship and suggested that having a surviving girl was more likely to affect the likelihood to have the following child compared to having a surviving boy. Chen (2002) used the data from the 1997 SFPC survey obtained the similar conclusion. Nonetheless, there was no research available to examine the behavior of son preference after controlling the variable of ideal family size. In the following two sections, this research employs the 2001 survey data to fill this gap.

According to the 2001 survey. Among the 13, 995 women who indicated one child as ideal family size, only 15.8% clearly stated that they wanted one boy, while 16.6% preferred one girl, and the majority, 67.6% women considered that the sex composition did not matter. Although a bit more rural women indicated son preference, 18.3% vs. 11.7%, the majority of both rural and urban women stated "doesn't matter". It is probable that once a woman accepted the one-child family norm, they also did not care the sex of the only child. Or alternatively, those women who did not care the sex of child were more likely to have a small ideal family size.

For those women who desired two children, the stated son preference was not obvious, too. Table 8 shows the percentage distribution of the desired sex composition of two children of

women who had at least one surviving child by their demographic, socio-economic and regional characteristics. It appears that most women desired one boy and one girl, regardless of their residence type, ethnicity, and educational achievement.

Table 8 Percentage distribution of desired sex composition for two children of women with at least one surviving children by socio-demographic and regional variables, China, 2001

	Composition of two desired children			Total cases
	One boy & one girl	Two boys or two girls	Doesn't matter	
Residence [1]				
Urban	74.5	2.9	22.8	15, 521
Rural	80.6	2.9	16.6	3, 520
Ethnic group				
Han majority	79.6	2.7	17.7	17, 332
Ethnic minority	79.0	3.7	18.1	1, 709
Educational level				
No schooling	82.3	3.3	14.4	4, 238
Primary school	80.2	3.0	16.9	6, 637
Secondary school	77.9	2.5	19.6	5, 975
High school above	76.0	2.5	21.5	2, 191
Regional difference [2]				
Advanced	70.8	3.4	25.7	6, 343
Middling	85.2	2.5	12.3	10, 761
Backward	75.7	2.8	21.5	1, 937
Total	79.4	2.8	17.7	19, 041

Source: Own calculations based on the 2001 SFPC survey.

Note: 1. Residence classified by agricultural and non-agricultural *hukou* status.

2. Three categories of regions using the SFPC definition in the early 1990s.

Nonetheless, previous studies suggest the presence of strong son preference given the effects of the sex of prior children on the following births (Fred and Liu 1986; Wang 1996; Chen 2002; Poston et al. 1997). Under the current birth control policy, the majority of urban women and less than half rural women were not entitled to have a second child. Therefore, the observed son preference was probably the combination result of the common two children preference with the birth control program. This shall be illustrated in the following section.

Ideal family size, son preference and actual fertility outcomes

This section examines the effects of the sex of prior child on the probability of women with one child continuing to have another child, in combination with the effects of ideal family size. The analyses are limited to women with one child ever-born and examines whether the presence of a female first-born increases the women's chances in transition to a second birth. To reflect the impacts from the birth control program, only women who had their first births after 1980 are included. The survival analysis and Cox partial-likelihood estimation procedure are applied.

Table 9 The proportion of women having second birth by the sex of their first child and mean ideal family size, 2001.

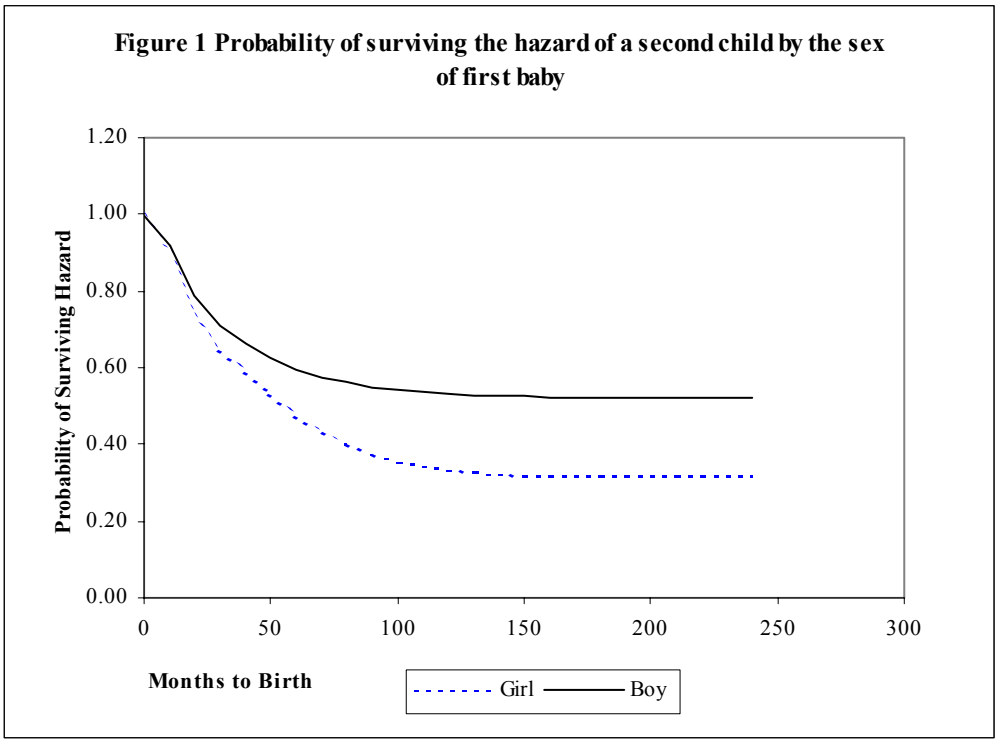
Sex of prior children	Case	Proportion of having another both	Mean ideal family size
Sex of first child	26, 072	48.2	1.71
Boy	13, 481	40.8	1.67
Girl	12, 591	56.1	1.75

Source: Computed based on the 2001 survey computer data.

Among women with one child, the proportions of women to have a second birth are presented in Table 9 for of women with one boy and for women with one girl, respectively. The mean number of their ideal family size was also presented. As can be seen, about 48% women with one child would have another child. However, women with one surviving girl averagely desired more children and more of them actually had another birth than women with one surviving boy.

Next, the survival data is described for women moving from first to second births by the sex of their first child (Figure 1). The survival curve for women with one girl steps down rapidly from a probability of near 1.0 of surviving the hazard of a second birth after 10-20 months, and levelled off from around 150 months to 250 months. At the end, about 70% women with one surviving girl moved to second births. Meanwhile, the survival curve gradually declined and levelled off from 100 months to 250 months, and about 40% women with one boy continued to have another births.

Figure 1 Probability of surviving the hazard of a second child by the sex of first baby



Subsequently, the Cox proportional hazard model is applied to estimate surviving hazard of transitions from first to second births. Meanwhile, the analyses do not include those women whose first births were twins. So the Cox regression model included 25, 435 women who had their first births after 1980.

The equation to estimate hazard functions is as follows:

$$\log h(t) = \log h_0(t) + b_1 X_1 + \ldots + b_k X_k \qquad (2)$$

where $h_0(t)$*is* means any function of time, similar to the constant concept in other forms of regression; X_1 to X_k are co-variates, and b_1 to b_k are hazard coefficients to be estimated. In this model, the same independent variables are used in the logistic regression model in Section 7.4. All these independent variables are time-independent as their values do not change over time.

The dependent variable, ***log h(t)***, is the predicated value of the hazard function at time *(t)*. In this model, it predicates the probability of a woman with one surviving child to have a second birth during the period of analysis. Table 10 presents the estimates of Cox Proportional Hazard model and relative hazards of women with one surviving child to continue to have a second child.

Table 10 Estimates of Cox proportion hazard models and relative hazard of women with one surviving child to continue to have a second child, 2001 (N=25, 415)

Variables		Coefficient	Standard deviation	Sig.	Exp (B)
Residence type	(Ref=urban)				
Rural		1.386	0.038	***	3.999
Ethnicity	(Ref=Minority)				
Han majority		0.126	0.033	***	1.134
Educational level	(Ref=high school +)				
No schooling		0.743	0.046	***	2.103
Primary school		0.620	0.044	***	1.859
Secondary school		0.435	0.043	***	1.545
Ideal Family size		0.541	0.018	***	1.718
Women's age		0.087		***	1.504
Age at first marriage	(Mean=22.03)	-0.121	0.004	***	0.886
Sex of first baby	(Ref=boy)	0.419	0.018	***	1.520
Regional difference	(Ref=Backward areas)				
Advanced areas		-1.119	0.037	***	0.327
Middling areas		-0.253	0.033	***	0.777
-2 Log Likelihood	237359.214				
Chi-square	12225.025				

Source: Cox proportional hazard model run on the 2001 survey data.

Note: 1. Excluded cases of women without children and with missing values; 13, 131 cases censored.

2. *** significant at the level P<0.005.

As can be seen, all women's demographic, socio-economic characteristics and regional factors are statistically significant covariates in determining the hazard rate of women moving from first to second births. The most important results are that both women's ideal family size and the sex of first baby have positive hazard coefficients. One more child in the desired number of children would 1.73 times the probability of having a second birth. Meanwhile, compared to women whose first birth was a boy, women with one surviving girl had 52% higher probability to have another birth. It is important to see that this likelihood is net effects of the probability of having another birth of other covariates. This suggests that both the desired number of children and the sex composition of prior birth played a role in actual fertility under the current birth control policy.

Other findings of the model are consistent with those of the logistic regression model. The hazard rate of rural residents of having a second birth would three times more than those of urban residents. With a Han majority ethnicity would reduce 12% probability of having a second birth. These two covariates strongly reflect the effects on fertility of the birth control program.

Every 5-year increase in age would increase 50% probability of having more births. This could suggest the decline of fertility between cohorts, but could also be the results of censored data up to the date of survey. However, the later the woman got married for her first marriage, the less likely she would experience the hazard of having a second birth. One-year increase in the age at first marriage would reduce 11% the hazard of having a second birth, after controlling other socio-economic covariates.

Women's educational level was found to be negative to the hazard of having a second birth. Compared to women with high school or above educational attainment, the lower the educational level, the higher the hazard of moving from first to second birth. As a comprehensive predicator of both birth control performance and socio-economic development, regional difference covariate is statistically significant in determining the hazard of having a second birth. Obviously, women in both "advanced" and "middling" areas were less likely to move from first to second birth than women in "backward" areas, and women in "advanced" areas had the least probability to have a second birth.

In general, this section reveals that the sex composition of women's first baby significantly affected the fertility result. The presence of a girl in first birth greatly increased the ideal family size and the possibility of having another birth, which was confirmed by the survival analysis and the Cox partial-likelihood model. Many authors considered this as evidence of son preference. However, it is a bit strange that no strong son preference was reported in surveys. Given the important roles played by women's ideal family size in actual fertility, the observed effects of son preference in fertility were probably the combined outcomes of the restriction on the number of children that a couple is allowed to bear and the common two-child ideal family size among most women.

Discussion and Conclusion

For the information available, a clear trend of changes in fertility preferences can be identified in the past two decades. On the one hand, more and more women were prepared to accept the official one-child family norm. The average desired number of children declined from above two in the 1980s to stably below two children in the late 1990s. All evidence suggested an

increasingly narrower gap between the state requirement and popular responses. However, as revealed in preceding sections, more than half married women still held the two-child preference by the early 2000s. Thus, two interesting questions are raised and addressed in this section: (1) why the two-child preference seemed to be common during the past two decades? and (2) what factors contributed to the continued decline in the family size preference in the 1990s?

It was believed that the traditional Chinese people would favour a large family size. The latest available and reliable evidence, namely the Buck and Qiao survey around 1930 and the 1982 one-per-thousand survey, reported that during the half century period from 1930 to 1970, the average cohort fertility of women was above six children (Barclay et al. 1976; Coale and Chen 1987). However, more recent studies discovered that the deliberate birth control was not an uncommon practice in traditional China (Zhao 1997; Lee and Wang 1999). The traditional family size preference might also be moderately high. More importantly, the dramatic fertility decline during the 1970s suggested the latent demands for fertility control before the nationwide birth control program.

There was evidence that the popular two-child preference was just established in recent decades and as early in the mid-1980s it had replaced the traditional large family size as the popular fertility preference (Whyte and Gu 1987). By the late 1980s, Greenhalgh (1994) found that villagers in Shannxi province outright rejected the idea of having many sons. In later studies, Greenhalgh and her colleagues further revealed that for most urbanites "one is enough", while for most peasants "two is best, one son is essential" (Greenhalgh, Zhu, and Li 1994; Greenhalgh and Winckler 2001).

It is not difficult to understand that peasants preferred two children, and as well one son at least. As Wang Feng (1996: 110) argued that "the strong desire for a minimum number of surviving children and at least one male offspring is deeply rooted in the socio-economic realities of rural China". In rural areas, the less developed economy and no state-sponsored welfare system made peasants have to rely upon themselves. The demands of family labour force, the necessity to carry on the family line, the support in old age and the protection of family against village bullies made at least one son essential. Meanwhile, daughters are also desired because they provide irreplaceable emotional support, which became even more obvious in the 1990s compared to the 1980s (Greenhalgh and Winckler 2001; Zhang 2002). Moreover, for the sake of safety, two children provide more assurance than the only one child in case that illness or accident could take one off (Greenhalgh 1993). In urban areas, the strict birth control program, the high living costs and the housing shortage prevent urbanites from having more than one child. Still, it has been the preference, the "real desire", for many urbanites to have a child being of each sex. It has often been complained that one child was too few and too lonely. The consideration for children safety and emotional support also make two children appealing for urbanites.

It appeared that both the decade-long birth control program and the rapid socio-economic development contributed to the decline in ideal family size across time. As discussed earlier, urban women, and women in "advanced" areas in terms of birth control program had fewer desired number of children than those in rural areas and in "middling" and "backward" areas in the late 1990s. It is hard to imagine that this would occur without the strong birth control program, just as Greenhalgh argued (1994: 12):

> The larger socio-economic environment certainly supported small-family norms, but it is unlikely that peasants would have declared only two children as ideal had the state not defined first three, then two, and finally one as the official norm…By embodying state demands in their conscious reproductive

> aspirations, the peasants were not only accepting, they were also unwittingly reproducing state control over their childbearing.

Nonetheless, the birth control program was not so powerful and effective to lower fertility preferences as commonly believed. A detailed literature review concluded that " [a]lthough coercive family planning programs might produce change in fertility preferences, the evidence is far from conclusive, even for China…" (Freedman 1997: 11). The persistence of two-child preference among more than half married women until the early 2000s seemed to support this perspective. But the experiences from other countries, especially from developed countries with very low fertility, offered a different viewpoints, as Bongaarts (2001: 276) suggested that "for the moment it appears reasonable to assume that desired family size will level off at about two". In this case, China may be similar to those post-transition societies, fertility went far below replacement level but the desired family size still lagged behind.

Previous studies have established a negative association between the ideal family size and socio-economic variables, including rural-urban residence, educational attainment, the mean age at first marriage, and the living standards, etc (Whyte and Gu 1987; Wang 1996; Shao 1999). One recent study also reported a cohort shift of fertility preference: the younger the cohorts, the fewer the desired number of children (Chen and Zhang 2003). The analyses in preceding sections also supported these findings. Quite recently, a comparison of women's fertility preference and their reproductive behavior, using linked data from surveys in four rural counties in Hebei and Shandong province in 1991 and 1994, discovered that the acceptance of policy-sanctioned family size followed a development gradient and reflected the degree of enforcement in birth control program. It was suggested that "high acceptance occurs in the most urban, industrialized county and in the county with the most rigid family planning policy " (Merli and Smith 2002: 557). Empirically, it is hard to separate the programmatic impacts and socio-economic factors on fertility, because women in developed areas normally have higher living standard and educational achievement and the birth control program has always been stronger benefiting from more socio-economic resources (Greenhalgh and Winckler 2001: 67). By the same token, it is the equally tough job to distinguish the respective contributions on changing fertility preference from the birth control program and socio-economic development.

Nevertheless, the rapid socio-economic development during the 1990s was likely playing a more important role in the slight but continued decline in the ideal family size as evidenced in the 1997 and 2001 survey. Certainly, the underlying mechanisms of socio-economic factors differed in urban and rural areas. For urbanites, the living pressure made urbanites less likely to consider many children as benefits even in the pre-reform era. Since the early 1980s, the increasingly popularisation of one-child family had contributed to urban parents' focus on creating perfect offspring, the "little emperor" (*xiao huangdi*). The rapid development in the 1990s largely created a consumer society in China at least in urban cities. The market force exhibited its "principle" in every aspect of social life, from the employment structure, the model of life style, the general perception of opportunity, and the attitudes towards children, etc. The improvement of living standard, the influences of public media, and the exposure to outside world induced urbanites to invest more on children to bear "quality" children for entering into the global economy (Greenhalgh and Winckler 2004). Although the "real" desire for many urbanites may be still two children, the attention on the quality side, especially in health and education of children, probably dampen such preference.

In rural areas, the effects of socio-economic factors affecting ideal family size embodied in several aspects. First, some rural socio-economic policies helped to alter peasants' higher fertility demands. For example, the Chinese government has gradually changed the rural land allocation system since the late 1980s, which stipulates that the portion of land allocated is fixed with family members at the original allocation time, and can no longer be changed even if families have new members. This means that an addition of a family member no longer brings more benefits (Shao 2000). Second, the popularisation of education and the increasing educational costs helped peasants to change their attitudes towards children. The Compulsory Education Law was enacted in 1986 and a number relevant regulations were created and implemented during the 1990s (Cai and Du 2001). In fact, even in the absence of this law, the Chinese peasants had already been eager to get their children educated, which was most important means for upward social mobility (Whyte and Gu 1987; Greenhalgh 1993). The official statistics suggested that the popularisation of 9-year compulsory education was well achieved during the 1990s (Ministry of Education 1998-2003). On the other hand, the increasing rising educational costs along with the deepened market reform were overwhelmingly considered as huge burden in rural areas (Greenhalgh, Zhu, and Li 1994; Chu 2001). In the pre-reform era, many children were considered beneficial in rural areas (Parish and Whyte 1978). But the popular idea of bearing "quality" children (Murphy 2004) and the rising educational costs were most likely reversed the parents attitudes towards children, either voluntarily or involuntarily achieving the Caldwell's transition of "wealth flow" (Caldwell 1982). These explicitly or implicitly affected younger cohorts in deciding the number of children they desired. Last but not least, many peasants, especially young migrant peasants, had already directly experienced the influences of market force when they worked and lived in urban areas. One research shows that returned migrants, probably one-third of all rural-urban migrants, were leading in changes in reproductive preference and behaviour (Murphy 2001). If one reads again what Freedman (1979) described what occurred in Taiwan and Thailand two decades ago, it will not be a big surprise to recognize the similar changes occurred along with rapid societal changes.

No clear evidence of son preference in the stated fertility preference, but it was shown in the behaviour. On the one hand, it can be argued that the strong son preference motivated couples, especially peasants to continue to have another child with a surviving girl. On the other hand, this was closely related to the parity-specific birth control policy. Since the mid-1980s, the policy has permitted rural couples to have a second child suppose the first was a girl, but excluding those who have already had a boy. Given the persistent two-child preference, it is probably the programmatic limitation that made the son preference apparent in behaviour. In this cease, the birth control program indeed affects the fertility preferences.

In general, this research shows that both the birth control program and socio-economic factors contributed to the decline of ideal family size but it was hard to separate their respective roles. While the birth control program primarily brought the popular family size preference down to replacement level from 1970s to 1980s, the rapid socio-economic development contributed to the further slight decline. Nonetheless, it appears that the family planning program very likely was responsible for the apparent sone preference in reproductive behaviour.

References

Arnold, Fred, and Zhaoxiang Liu. 1986. Sex preference, fertility, and family planning in China. *Population and Development Review* 12 (2):221-246.

Barclay, George W., Ansley J. Coale, Michael A. Stoto, and T. James Trussell. 1976. A Reassessment of the Demography of Traditional Rural China. *Population Index* 42 (4):606-635.

Bongaarts, John. 2001. Fertility and reproductive preferences in post-transitional societies. In *Global Fertility Transition*, edited by R. A. Bulatao and J. B. Casterline. New York: The Population Council.

Cai, Fang, and Yang Du, eds. 2001. *2001: Report on China's Population Problem: Education, Health and Economic Growth*. Beijing: Social Science Documentation Publishing House.

Caldwell, John C. 1982. *Theory of Fertility Decline*. San Diego: Academic Press.

Chen, Shengli, and Shikun Zhang. 2003. *Research on Contemporary People' Preference of Marriage and Childbearing: 2002 National Preference of Marriage and Childbearing Survey*. Beijing: China Population Publishing House.

Chen, Wei. 2002. Sex preference and fertility behaviors of Chinese women. *Population Research* 26 (2):14-22 [in Chinese].

Choe, Minja Kim, Robert D. Retherford, and Seung-Kwon Kim. 2004. Very low fertility in South Korea: Patterns and prospects. Paper read at the 2004 Annual Meeting of the Population Association of America, 1-3 April 2004, at Boston, Massachusetts.

Choe, Minjia Kim, and Noriko O. Tsuya. 1991. Why do Chinese women practice contraception? The case of rural Jilin province. *Studies in Family Planning* 22 (1):39-51.

Chu, Junhong. 2001. Prenatal sex determination and sex-selective abortion in rural central China. *Population and Development Review* 27 (2):259-281.

Coale, Ansley J., and Shengli Chen. 1987. *Basic Data on Fertility in the Provinces of China: 1940-82*. Vol. Working Paper 104. Honolulu: East-West Population Institute.

CPIRC Research Group. 2003. Studies of China's fertility level since 1990. Paper read at the 5th National Population Census Scientific Symposium., at Beijing, China.

Croll, Elisabeth J, Delia Davin, and Penny Kane, eds. 1985. *China's One-Child Family Policy*. Basingstoke, Hampshire: Macmillan.

Feeney, Griffith, Feng Wang, Mingkun Zhou, and Baoyu Xiao. 1989. Recent fertility dynamics in China: Results from the 1987 one percent population survey. *Population and Development Review* 15 (2):297-322.

Feng, Xiaotian, and Qingsong Zhang. 2002. Review of research on changes in fertility preference of urbanites and peasants. *Market and Demographic Analysis* 8 (5):21-31[in Chinese].

Fred, Arnold, and Zhaoxiang Liu. 1986. Sex preference, fertility , and family planning in China. *Population and Development Review* 12 (2):221-246.

Freedman, Ronald. 1979. Theories of fertility decline: a reappraisal. *Social Forces* 58 (1):1-17.

———. 1997. Do family planning programs affect fertility preferences? A literature review. *Studies in Family Planning* 28 (1):1-13.

Greenhalgh, Susan. 1993. The peasantization of the one-child policy in Shaanxi. In *Chinese Families in the Post-mao Era*, edited by D. Davis and S. Harrell. Berkeley: University of Califonia Press.

———. 1994. Controlling births and bodies in village China. *American Ethnologist* 21 (1):3-30.

———. 2003. Science, modernity, and the making of China's one-child policy. *Population and Development Review* 29 (2):163-196.

Greenhalgh, Susan, and Edwin A Winckler. 2001. Chinese State Birth Planning in the 1990s and Beyond. Washington. D.C.: Resource Information Center, U. S. Department of Justice.
———. 2004. *Population and Power in Post-Deng China [in press]*. Standford, California: Standford University Press.
Greenhalgh, Susan, Chuzhu Zhu, and Nan Li. 1994. Restraining population growth in three Chinese villages, 1988-93. *Population and Development Review* 20 (2):365-395.
Gu, Baochang. 1996. Fertility trends in rural China in the 1980s: Cohort effect versus period effect. In *China: The Many Facets of Demographic Change*, edited by A. Goldstein and F. Wang. Colorado, USA: Westview Press.
Hermalin, Albert, and Xian Liu. 1990. Gauging the validity of responses to questions on family size preferences in China. *Population and Development Review* 16 (2):337-354.
International Statistical Institute. 1991. *Fertility in China: Proceedings of the International Seminar on China's In-Depth Fertility Survey*. Voorburg, the Netherlands: International Statistical Institute,.
Knodel, John, Vipan Prachuabmoh Ruffolo, Ratanalangkan Pakamas, and Kua Wongboonsin. 1996. Reproductive preferences and fertility trends in post-trnasition Thailand. *Studies in Family Planning* 27 (6):307-318.
Lee, James Z., and Feng Wang. 1999. *One Quarter of Humanity: Malthusian Mythology and Chinese Realities, 1700-2000*. Cambridge, Massachusetts: Harvard University Press.
McDonald, Peter F. 1998. Contemporary fertility patterns in Australia: First data from the 1996 census. *People and Place* 6 (1):1-13.
Merli, M Giovanna, and Herbert L Smith. 2002. Has the Chinese family planning policy been successful in changing fertility preferences? *Demography* 39 (3):557-572.
Ministry of Education. 1998-2003. *China Educational Statistics Yearbook*: China Education Publishing House.
Murphy, Rachel. 2001. Return migration, the local state and rural urbanisation. In *The New Chinese City: Globalisation and Market Reform*, edited by J. R. Logan. Oxford: Blackwells.
———. 2004. Turning peasants into modern Chinese citizens: "Population quality" discourse, demographic transition and primary education. *The China Quarterly* 177:1-20.
Ogawa, Naohiro. 2003. Japan's changing fertility mechanisms and its policy responses. *Journal of Population Research* 23 (1):89-106.
Parish, William L., and Martin King Whyte. 1978. *Village and Family in Contemporary China*. Chicago: University of Chicago Press.
Poston, Dudley L, Baochang Gu, Peihang Peggy Liu, and Terra McDaniel. 1997. Son preference and the sex ratio at birth in China: A provincial level analysis. *Social Biology* 44 (Spring):55-76.
Shao, Xiazhen. 1999. Comparative studies on fertility preference before and after childbirth of urban and rural households. *China Population Science* (1):20-26.
———. 2000. Analyses of impacts of land allocation system to fertility. *China Population Science* (5):17-24 [in Chinese].
Tian, Xueyuan. 1995. *Materials of the 1992 China Household Economy and Fertility Sample Survey in 10 Provinces and Cities*. Beijing: China Economy Publishing House.
United Nations. 1987. *Fertility Behaviour in the Context of Development: Evidence from the World Fertility Survey*. Edited by Department of International Economic and Social Affairs. Poppulation Studies, No. 100 vols. New York: United Nations.
Wang, Feng. 1996. A decade of the one-child policy: Achievements and implications. In *China: The Many Facets of Demographic Change*, edited by A. Goldstein and F. Wang. Boulder, Colorado: Westview Press.

Whyte, Martin King, and S. Z. Gu. 1987. Popular response to China's fertility transition. *Population and Development Review* 13 (3):569-571.
Zeng, Yi. 1997. Dilemmas of family size norms in China. In *The 23rd General Population Conference*, edited by IUSSP. Beijing: IUSSP.
Zhang, Guangyu. 2004. Very low fertility in China in the 1990s: An illusion of birth underreporting? Paper read at the Annual Meeting of the Population Association of America, 1-3 April, 2004, at Boston.
Zhang, Weiguo. 2002. Changing nature of family relations in a Hebei village in China. *Journal of Contemporary Asia* 32 (2):147-170.
Zhao, Zhongwei. 1997. Deliberate birth control under a high-fertility regime: Reproductive behavior in China before 1970. *Population and Development Review* 23 (4):729-767.
Zhou, Lianfu, Xiaomei Guan, and Shuwen Li. 1997. Research on the relationship between fertility and socio-economic factors. *Population Journal* (5):58-64 [in Chinese].