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Sex Ratio at Birth and Son Preference in China

Baochang Gu*
Yongping Li**

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《ABSTRACT》

China's population and family planning program has been successful. Women's fertility as measured by total fertility rate (TFR) has declinedfrom 5.8 in 1970 to 2.3 in 1990, accordingly the annual crude birth rate(CBR) has declined from 34 per thousand in 1970 to 21 per thousand in1989, and the annual natural growth rate from 2.6 percent in 1970 to 1.4percent in 1989 (Coale and Chen, 1987; SSB, 1991; Gu, 1994). While thisis indeed an astonishing achievement for a developing country to have itsfertility down to replacement within a short period, some new issuesemerging along with the rapid fertility decline require carefulconsiderations. One of them is the uprising of the sex ratio at birth inChina. The 1990 population census reported the sex ratio at birth inChina of 113.8 in 1989, which is obviously much higher than the acceptablelevel of normal ratio around 106. It has received since then a lot of tention in China and abroad, among demographic professionals andgovernmental agencies alike (Hull, 1990; Johansson and Nygren,

* Director, China Population Information and Research Center, Beijing, China
** Professor,Institute of Population Research, Peking University, Beijing, China

1991; Xuand Guo, 1991; Tu, 1993; Gu and Xu, 1994; among others). Based on theavailable demographic data and research results this paper will first havea review of the patterns and trends of sex ratio at birth in China, thenturn to the immediate causes of abnormal sex ratio at birth and thedeterminants of the son preference, followed with a conceptual frameworkfor understanding of the phenomenon, and finally the policy implicationsand recommendations will be discussed.

I. Pattern and Trends of Sex Ratio at Birth in China

Before 1980 when the fertility was relatively high, the sex ratio at birth in China was by and large within the normal range and attracted little attention of the research community and the government. Table 1 and Fig

Table 1. Sex Ratio at Birth: China, 1970–1989

Parity of Women					
Year	SRB	Year	SRB	Year	SRB
1970	105.9	1977	106.7	1984	108.5
1971	105.2	1978	105.9	1985	111.4
1972	107.0	1979	105.8	1986	112.3
1973	106.3	1980	107.4	1987	111.0
1974	106.6	1981	107.1	1988	108.1
1975	106.4	1982	107.2	1989	113.9
1976	107.4	1983	107.9		

Sources: 1. 1970–1988 from SFPC (1990).
2. 1989 from SSB (1991).

ure 1 present the longitudinal change of thethe reported sex ratio at birth in China from 1970 and 1989, and the figure reveals a clear tendency of increase after 1980. A small deviation of the trend, as a slightly decrease in the sex ratio at birth between 1986 and 1988, is probably due to the underreporting of immediate events of female births by the 1988 survey. Overall, the sex ratio at birth in China has been rising over the decade of the 1980s, which is particularly the case in the late 1980s.

The uprising of the sex ratio at birth in China may be furtherexamined by decomposing it by parity of women. Table 2 and Figure 2present the sex ratio at birth by parity in China from 1981 and 1989.

Firstly, it tells an important fact that during the 1980s the observed sexratio at birth for parity 1 is around the normally expected level of 106. It suggests that the increasing trend of the sex ratio at birth shown in Figure 1 is actually a result of the increase in sex ratios at birth for parity 2 and above. It

Table 2. Sex Ratio at Birth by Parity: China, 1981–1989

	Parity of Women				
Year	1	2	3	4	5+
1981	105.1	106.7	111.3	106.5	114.1
1982	106.6	105.2	109.4	112.9	109.9
1983	107.8	107.2	109.5	104.7	112.1
1984	102.5	113.3	113.0	115.3	127.3
1985	106.6	115.9	114.1	126.9	117.3
1986	105.4	116.9	123.1	125.3	123.5
1987	106.8	112.8	118.9	118.6	124.6
1988	101.5	114.5	117.1	123.1	108.7
1989	105.2	121.0	124.3	131.7	129.8

Sources: the same as those for Table 1.

can be seen from Figure 2 that there exists a distinctive classification of two groups. While the sex ratios at birth for parity 1 over the years have been normal, the sex ratios at birth for parity 2 and above are much higher than the normally expected level. And the higher the order of birth the higher the sex ratio at birth. It indicates that the imbalance between male and female births has been mainly occurring among the births of high orders. Moreover, the abnormally high sex ratio at birth for parity 2 and above is becoming more and more serious over the decade. By the end of the decade, they were all at the level as high as above 120, which is implausible to be explained by either biological or ethnical factors. According to the 1990 population census, the first births in 1989 account for 50% of the total births with a sex ratio at birth of 105.2, the second births for 31% of the total with a ratio of 121.0. The abrupt increase in sex ratio at birth from parity 1 to parity 2 results from a difference of 15.8 male births per 100 female births. To look at it closer the abnormal sex ratio at birth may be further decomposed by thenumber and sex of the siblings, which is presented in Table 3 below.

Based on the 1% sampling data of the 1990 census, more detailed information is provided in the table with the computed results of observed sex ratios of surviving children by residence and education of mother and by number and sex of previous surviving siblings. The sex ratio ofsurviving children aged 0–1.5 born during 1989 and the first half of 1990 is high, i.e. 115.3 surviving male children per 100 surviving femal echildren. It can be seen from the table that regardless of residence and education, the sex ratios of surviving children for women with no children or one son tend to be in the normal and acceptable range. This suggests that the majority of women, i.e. those giving a first birth, and those with a son and giving a second birth, is not part of the group at risk

Table 3. Observed Sex Ratio of Surviving Children Born in 1989 and the First Half of 1990, by Number and Sex of Surviving Children, Residence and Education: China, 1990

	SURVIVING CHILDREN									
	0	1		2			3+			Total
Sex	0m	1m	0m	2m	1m	0m	3+m	1+m	0m	
	0f	0f	1f	0f	1f	2f	0f	1+f	3+f	
	CHINA									
SR	105.6	101.4	149.4	74.1	116.4	224.9	64.4	121.9	219.4	115.3
	RESIDENCE									
County										
SR	105.1	101.1	152.9	73.1	114.6	226.6	63.6	119.7	215.9	116.0
Town										
SR	106.0	100.1	143.6	79.4	120.4	215.2	71.7	125.3	215.6	115.5
City										
SR	106.0	103.8	147.7	69.7	116.4	233.5	52.1	125.4	237.0	113.8
	EDUCATION									
<1 Year Schooling>										
SR	99.2	99.2	129.5	74.8	115.0	209.2	66.8	119.0	186.0	111.9
1-5 Year Schooling										
SR	104.3	99.5	148.0	74.3	116.9	223.7	62.8	117.0	237.3	115.0
6-8 Year Schooling										
SR	107.5	105.3	159.9	73.5	118.2	239.2	68.8	146.7	245.8	117.4
9+ Year Schooling										
SR	108.1	100.1	157.2	71.6	111.3	228.9	41.2	131.3	223.3	114.1

Note: 1. Calculated from a 1% sampling of China's 1990 census data, some figures may disagree with those of published in 10% tabulations.

2. Twins are not considered due to poor sex identification.

for abnormally high sex ratio at birth. While the sex ratios of surviving children for women with no son but only daughter(s) are all extremely high, even above 200, the sex ratios of surviving children for women with son(s) but no daughter tend to be too low to be in the normal range. This pattern is evident that a sex-selective process is involved in the childbearing. The imbalance between male and female births has been mainly occurring not only among the births of high orders but mores pecifically among women with daughter(s) but no son, which suggest sinterference in fertility behavior under strong son preference. It may be noticed however, although women with no son tend to have extremely high sex ratio of surviving children, women with 6-8 year education (junior high school) appear to have a sex ratio at birth relatively higher.

Table 4. Sex Ratio at Birth By Province and Residence: China, 1989

Rank	Province	Total	City	Town	County
	CHINA	111.3	108.9	111.9	111.7
1	Guizhou	103.4	99.4	109.0	103.7
2	Tibet	103.6	112.4	106.0	102.8
3	Xinjiang	104.1	106.6	104.6	103.6
4	Shanghai	104.1	103.9	104.0	104.7
5	Qinghai	104.6	115.3	92.5	103.9
6	Beijing	107.1	106.1	105.8	108.9
7	Yunnan	107.3	103.9	105.3	107.6
8	Heilongjiang	107.3	105.5	106.4	108.6
9	Jilin	107.8	106.0	107.3	108.5
10	Gansu	108.4	106.6	112.6	108.5
11	Inner Mongolia	108.5	105.2	105.3	110.1
12	Hubei	109.5	108.8	115.0	109.4
13	Ningxia	109.7	111.8	110.0	109.4
14	Fujian	109.9	109.4	124.0	108.9
15	Shanxi	110.1	111.5	109.3	109.9
16	Hunan	110.1	105.6	111.1	110.5
17	Shaanxi	110.3	113.6	116.7	109.6
18	Tianjin	110.4	106.4	107.6	115.4
19	Jiangxi	110.4	112.8	112.1	109.9
20	Liaoning	110.5	107.5	107.0	113.2
21	Hebei	110.9	104.0	108.4	111.9
22	Anhui	111.3	108.9	107.8	111.0
23	Guangdong	111.3	114.0	120.5	109.1
24	Sichuan	112.1	108.9	106.0	112.8
25	Jiangsu	113.8	112.0	107.3	114.5
26	Shandong	115.0	113.3	117.2	115.2
27	Hainan	116.1	111.1	136.2	114.7
28	Henan	116.2	113.0	113.9	116.6
29	Zhejiang	116.7	107.5	119.2	118.2
30	Guangxi	117.4	113.2	110.4	118.1

Source: SSB (1991): 45, 427-429.

The pattern of the sex ratio at birth in China can also be observed in terms of the considerabe regional variation among the 30 provinces, municipalities and autonomous regions (all called provinces below), which is presented in Table 4. According to the 1990

population census, Guangxi and Zhejiang have the highest sex ratio at birth in 1989, which is as high as of 117, and Guizhou and Tibet have the lowest sex ratio at birth in 1989, which is as low as of 103.4. Among the 30 provinces, 21 of them have a sex ratio at birth higher than 108, which is above the normal acceptable range. Moreover, for the other 9 provinces with sex ratio at birth less than 108, which is in the normal range, it includes some of the provinces which are socio-economically most advanced with the lowest fertility in China, such as Shanghai and Beijing, which are virtually the metropolitan areas, but also some of the provinces which are socioeconomically least developed with the highest fertility in China, such as Guizhou, Tibet, Xinjiang, Qinghai, Yunnan, etc. It appears that the phenomenon of abnormal sex ratio at birth is more associated with the region in the process of socioeconomic development and fertility transition.

Ⅱ. Immediate Causes of Sex Ratio at Birth in China

The abnormal sex ratio at birth observed in China in the decade of the 1980s can be caused by either underreporting of female births relative to male births, sex-selective abortion after pre-natal sex identification of the fetus, or infanticide and abandonment of female babies, though their demographic implications may differ from each other.

To examine the impact of the sex-differential underreporting of births to the increase of sex ratio at birth, a research group of the Institute of Population Research, Peking University (IPRPU) and China Population Information and Research Center (CPIRC) has applied the reverse survival method to data from the 1990 population census, the 1987 one percent population survey, the 1988 two-per-thousand fertility and contraception survey, and shown that the most important cause of the higher than normal sex ratio at birth reported was due to sex-differential underreporting (Zeng et al. 1993). The analysis with reverse survival method indicates that the underreporting rates of female births are more than double the underreporting rates of male births in most years between 1983 and 1988. For example, with the birth statistics of 1989 and the first half of 1990 from the 1990 census data, it is estimated that the underreporting rate for male births is 2.2 percent while it is as high as 5, 6 percent for female births (Tu, 1992). As shown in Table 3, Zeng and his colleagues have further shown that the underreporting of female births accounts for about one half to three-quarters of the difference between the reported sex ratios during the second half of the 1980s and the values expected under normal circumstances. The sex ratio at birth has reduced substantially after adjustment for the underreporting. Gao in another study, also show similar results that among the underreported births in 1989 more than two thirds are females (Gao, 1993).

While the analysis has demonstrated that the underreporting of female births relative to male births rather than female infanticide is primarily responsible for the abnormal high

Table 5. Estimated Contribution of the Underreporting of Female Births to the Increase in the Reported Sex Ratio at birth: China, 1983-1990

Year (1)	Reported SRB (2)	Excess over 106 (3)	Estimated SRB (4)	(2)-(4) =(5)	(5)/(3) =(6)
1988 2 Per-thousand Fertility Survey					
1983	107.7	1.7	106.2	1.5	88.2%
1984	108.3	2.3	106.5	1.8	78.3%
1985	111.2	5.2	107.8	3.4	65.4%
1986	112.1	6.1	108.8	3.3	54.1%
1/1987-6/88	110.0	4.0	107.0	3.0	75.0%
1990 Census 10 % Computer Tabulation					
1989	113.8	7.8	109.8	4.0	51.3%
1990 Census 1 % Sample Data Tape					
1/1989-6/90	115.4	9.4	111.4	4.0	42.6%

Source: Cited from Zeng et al. (1993)

sex ratio at birth, the sex ratio at birth after adjusted for underreporting is still higher than the normal level of 106. Table 5 may meanwhile suggest that while the reported sex ratio at birth from population statistics is increasing, theproportion of the higher than normal value of the sex ratio at birth explained by the sex-differential underreporting tends to be decreasing over the decade. This makes the underreporting relatively less responsible for the abnormal high sex ratio at birth observed in China inthe late 1980s.

An alternative cause of the abnormal sex ratio at birth is sex selective abortion. The sex of a fetus can be detected during pregnancy by either chorionic villus sampling, amniocentesis method or ultrasound B machine. While the chorionic villus sampling and amniocentesis method can be applied to determine the sex of a fetus at the relative early stage of the pregnancy but require more sophisticated technology and subject tohigh risk of side effect, the ultrasound B machine is able to identify the sex of a fetus at the relative late stage of the pregnancy but becomesincreasingly available and accessible in China over the decade of the 1980s.

Hospital birth records are reliable to examine whether or to what extent the sex selective abortion is responsible for the abnormal sex ratio at births in China, given that there is no possibility to have the new born baby underreported or infanticided in a hospital setting. The Hospital birth records from a large-scale surveillance survey for birth defects organized by Western China Medical University has reported the sex ratio of live births delivered in 945 hospitals over the country in 1988 through 1991 are 108.0, 108.3, 109.1, and 109.7, respectively. Not only

they are higher than the normal value of 106 but also show an increasing tendency over time. Meanwhile, from another similar surveillance survey for birth defects, the sex ratios of aborted fetuses are 94.6 and 96.8 in rural and urban areas, respectively (Zeng et al., 1993, and see a more detailed discussion in B. Li, 1994). All these apparently suggest the occurrence of prenatal sex identification of fetus prior to induced abortion.

More recently, a survey on the sex ratio of aborted fetuses was conducted jointly by China Population Information and Research Center and Zhejiang Family Planning Commission among ten counties in Southern Zhejiang in 1993. As indicated above, Zhejiang is the province with the highest sex ratio at birth (117) according to the 1990 census. Most of the counties in the survey had a sex ratio at birth higher than 120 in 1989 according to the 1990 census. Table 6 presents the sex ratio of aborted fetuses by surviving children.

Among the more than 10,000 cases record-

Table 6. Sex Ratio of the Aborted Fetus by Surviving Children:Southern Zhejiang, 1993

Surviving Children	Total	Male Fetus	Female Fetus	Sex Ratio
0	4,518	2,345	2,173	107.9
1	5,683	2,384	3,299	72.3
2	443	218	225	96.9
3	98	41	57	71.9
4+	40	19	21	90.5
Total	10,782	5,007	5,775	86.7

ed in the ten counties for the whole year of 1993, the sex ratio of fetuses was 86.7, much lower than the normal value for sex ratio of fetus, a figure higher than 106. The sex ratio of aborted fetuses for women with one child is the lowest (72.3), which suggests strong interference by sex determination of fetus. The interference becomes more evident when the sex ratio of aborted fetuses is examined by the number as well as the sex of surviving children as presented in Table 7. The sex ratio of aborted fetuses for women who has one daughter but no son is the lowest (51.0).

For those women who have at least one son, the sex ratio of aborted fetuses tends to be around the normal level which suggests less interference, but for those women who have no son, the sex ratio of aborted fetuses is much lower than normal, which is most likely affected by sex identification of fetusbefore induced abortion. It would be interesting to compare this table with the one (Table 3) on sex ratio at birth by the number and the sex of siblings, the trend of sex ratio of aborted fetuses is consistent with the trend of sex ratio of surviving children. It indicates that other than the underreporting of female births, sex selective abortion following

Table 7. Sex Ratio of the Aborted Fetus by Number and Sex of Surviving Children: Southern Zhejiang, 1993

Surviving Male	Children Female	Total Aborted	Male Fetus Aborted	Female Fetus Aborted	Sex Ratio of Aborted
0	0	4,518	2,345	2,173	107.9
1	0	2,559	1,329	1,230	108.0
0	1	3,124	1,055	2,069	51.0
2+	0	81	40	41	97.6
0	2	105	38	67	56.7
0	3+	15	4	11	36.4
1+	1+	380	196	184	106.5
Total		10,782	5,007	5,775	86.7

sex identification of fetus by ultrasound B machines or other diagnostic methods, is additionally and likely to be increasingly responsible for the increase of sex ratio at birth in China.

Since the abnormal sex ratio at birth in China in the late 1980s was mainly due to underreporting of female births and sex selective abortion as discussed above, infanticide and abandonment is relatively minor in its effect to the phenomenon. Both modern contraceptives and methods of sex identification of the fetus becomes more and more available and affordable in China, it becomes less necessary for parents to resort to infanticide or abandonment if the pregnancy is undesirable, particularly in relatively more developed area, and among those relatively more educated and well-off couples. But it does occur more often in some remote rural areas.

Table 8. Comparison of Estimated Infant Mortality Rates by Sex and Residence: China, 1981 and 1989

(in per thousand)

Year	China		City		Town		County	
	Male	Female	Male	Female	Male	Female	Male	Female
1981	38.88	36.87	25.05	25.85	24.27	22.60	41.41	39.37
1989	35.54	40.40	25.33	29.36	27.83	32.17	43.42	49.41

Source: Adopted from Sun et al. (1993).

Among the abandoned babies it tends to be more girls than boys. For example, in one county of Southern Zhejiang, among the 2,928 babies abandoned between 1982 and 1991, 95.4 percent of them are females, abandoned male babies only account for less than 5 percent. At this point particular attention should give to the rising of the female infant

mortality rate in the 1980s. Table 8 is a comparison of the infant mortality rates by sex and residence in 1981 and 1989, according to a study which has estimated the change in infant mortality over the 1980s (Sun et al., 1993; S. Li, 1994). During the 8 years between 1982 census and 1990 census, while the infant mortality for boys has been decreasing by 3.34 per thousand, the infant mortality for girls has been rather increasing by 3.53 per thousand. While the infant mortality rate for girls was lower than that for boys in 1981, which is usually regarded reasonable, the infant mortality rate for girls turned to be higher than that for boys in 1989. This trend, according to the estimate, is even more profound in the rural areas, where as discussed above the sex ratio at birth is also exceptionally high. Infant death is an event which occurs after the time of birth and should not be as part of the calculation for the sex ratio at birth. However, very often in China the baby dies immediate after birth may be registered neither in birth statistics nor in death statistics, and when more girls than boys die in the infant period it will inevitably cause the upward bias of the sex ratio at birth in the reported statistics. In this sense, infant mortality has to be as part of the study of the issue on sex ratio at birth. The more frequent deaths of female infants than male infantsare more likely resulted from neglect and mistreatment of female babies by gender discrimination in health care, parental affection, food and nutrition, because they are less valued and concerned.

The underreporting of female births, the sex selective abortion, and infanticide and abandonment are the immediate causes of the abnormal sex ratio at birth in China observed in recent years. It is argued that sex- differential underreporting of births and sex-selective induced abortion after prenatal determination are mainly responsible for the increase of the reported sex ratio at birth in China during the late 1980s (Zeng et at., 1993). Field surveys indicates however, after the efforts in improvement of birth statistics, sex-selective abortion may become more significant factor in its impact on the abnormal sex ratio at birth.

Moreover, local experience suggests that the importance of the three immediate causes to the abnormal sex ratio at birth may vary by areas. For areas where family planning program is less effectively implemented, the underreporting of female births may be more likely responsible, whereas the areas with relatively developed economy, the knowledge and technology of prenatal sex determination of fetus are more available, accessible and affordable, the sex-selective abortion becomes a factor increasingly responsible. Infanticide and abandonment are relatively more often occurring in the remote and poor rural areas.

Ⅲ. Determinants of Son Preference in China

As discussed above, underreporting of female births, the sex selective abortion, and infanticide and abandonment are the immediate causes of the abnormal sex ratio at birth

in China observed in the recent years. Though their demographic implication may differ from each other, all reflect strong son preference in people's childbearing and childbearing. With a history of being an agrarian society, son preference has long tradition in China. Over the past twenty years fertility has declined dramatically in China in terms of number of children per woman. Along with the rapid fertility decline, son preference becomes more dominant in people's fertility behavior, "even though the attitudes of sex preference in that population remain constant over time" (Pong, 1994). When fertility is high people may satisfy their sex preference to have son(s) in the number of children they are going to have. When fertility declines dramatically however, people will not be able to have the number of children they would like to have because of the strict population policy or social and economic constraints, they switch to a "quality for quantity" strategy of fertility (Gu and Peng, 1992; Gu, 1992). In a socio-cultural setting with strong son preference but under rapid fertility decline, couples will be more conscious of their sex preference and very likely to seek various means to ensure the sex of child they most desire in the limited number of children they are going to have. At this time, modern technology such as ultrasound B machine and other sex- detectable methods concurrently become available, which in one way or another facilitates the achievement of son preference in childbearing.

The determinants of son preference in China are fourfold.

1) Family labor. For the peasant households, family prosperity is mainly dependent on the physical labor, particularly male labor for the heavy work in agricultural production, which is more so in the remote and poor rural areas. The necessity of having son becomes even stronger after the adoption of household responsibility system in rural areas in the 1980s, when the household once again becomes the basic unit of production and distribution in rural areas. Experience indicates that family without son will be more likely in misery in life and difficult to get rid of poverty. Family with only daughters encounters a variety of daily difficulties, such as carrying water from far away every day, guarding the fruit-yard over night in the harvest season, etc.

2) Elderly support. Along with the economic growth and improvement of income, some couple may not so necessarily need to have son(s) for immediate labor in family production, but they worry about who is going to take care of them when they get old since daughter will sooner or later marry out and are not supposed to support their own parents according to the local tradition and culture, while the social welfare system is only at its preliminary stage in rural areas.

3) Women's status. Though women's status in China has been greatly improved in the past several decades, women, particularly in the remote and rural areas, still rely on sons as a means of security of their status and position at home and in community. Women without son may encounter various day to day problems and feel inferior to those with

sons. To have a son or not seems to be a crucial indicator for women's status in many rural areas. The strong aspiration for improving the status of women with only daughters become a strong motive to have more children before a son finally comes. Alternatively they have to prevent the birth of female for the opportunity to have a son. In a focus group survey conducted in a county of Guangdong province in 1993, a rural woman with only daughters said, "Sons rather than daughters are the real property of parents, and therefore, even a stupid son is better than a daughter. I have been even dreaming of having a son" (Gu and Xie, 1994).

4) Family line. Traditionally, the family line in China is continued by sons rather than daughters. In the focus group survey in a county of Ningxia in 1993, a village leader said, "One may be looked down upon by the others if he or she does not have a son. When quarrelling with neighbors, the feeling of a couple with only daughters are often likely to be hurt by other by denouncing, ' May you be the last of your family line!' This is something much more intolerable than to be heavily beaten" (Gu and Xie, 1994). Moreover, for those they are the early birds to get well-off in the booming of rural economy since the economic reform, they become increasingly concerned about who is going to take over the property they have accumulated if they do not have a son.

Although all these factors may have associated with people's attitude of son preference in childbearing it seems vary along with the level of socioeconomic development of the local areas. For those in more remote and poor areas, people's son preference may be more motivated by economic reasons, they desperately need male labor to run the daily field operation. When the local economy is growing, people turn to rely more on capital, technology or knowledge rather than physical labor to get prosperous, boy may not be immediately needed for household economy but more so as care-taker for parents in the old age. For these areas and families with booming economy and tremendous increase of income, both family labor and elderly support become less crucial in the determinants of son preference, social and cultural factors such as security of women's status and position at home and in the community, continuation of family line are mainly dominating in people's attitude of son preference.

In a nationwide survey on women's status conducted by All-China Women's Federation in 1990, it was asked the male and female respondents respectively the question concerning their perception on gender inequality. The results are presented in Table 9. The responses are ranked according to the degree of the seriousness perceived by the respondents concerning gender inequality. 1 means most serious, 8 means least serious. The Non-response rate for male is relatively higher than that for female, which indicates that the gender inequality is more concerned by women than men. The proportion of the respondents perceiving no gender inequality for male is higher than that for female, which is more so among rural respondents, which indicates that women, particularly

Table 9. The Degree of the Seriousness of the Gender Inequality According to the Perception of the Respondents

TYPES OF	TOTAL		URBAN		RURAL	
GENDER INEQUALITY PERCEIVED	M	F	M	F	M	F
1. Higher Score for School Admission	6	7	3	3	7	7
2. Less Opportunity for Employment	3	3	1	1	3	4
3. lower Job Payment	5	6	5	7	5	6
4. Higher Likelihood to Be Fire	8	8	8	8	8	8
5. More Difficult for Remarriage	7	5	6	5	6	5
6. More Vulnerable to be Insulted	4	4	7	4	4	3
7. More Discriminated due to No Son	1	1	2	2	1	1
8. Less Qualified for Inheritance	2	2	4	6	2	2
None of the Above Perceived (%)	23.9	20.6	17.5	16.2	25.3	21.6
The Non-Response Rate (%)	28.2	26.2	22.4	20.0	29.5	27.6

Note: 1-8 refers to the degree of seriousness of the gender inequality perceived by the respondents, i.e. 1 the highest, 8 the lowest.

Source: Adopted from Tan (1994).

rural women are more sensitive, more concerned about gender inequality. Nevertheless the majority of the respondents perceived the phenomenon, but in different ranks. While among the urban respondents, the gender inequality is more perceived in opportunity for employment, being discriminated due to no son, and score for school admission, among the rural respondents, it is more perceived in being discriminated due to no son, qualification for inheritance, and vulnerability to be insulted (for women) and job opportunity (for men). It is evident that for women, particularly those in rural areas, their status and position at home is to a great degree dependent upon their ability to bear children, particularly whether they are able to bear a son. Many women feel that they are discriminated only because they fail to have a son, which is by far the most seriously perceived in gender inequality. And only next to that is the less qualification of women for inheritance, which indicates that women are not equally regarded as successor of the family line. All suggest that son preference is closely associated with the issue of women's status, and traditional culture in gender inequality is quite influential to son preference, which affects tremendously people's fertility behavior, particularly in the setting of rapid fertility decline.

Ⅳ. A Conceptual Framework of Abnormal Sex Ratio at Birth By Development

Having discussed the basic situation of sex ratio at birth in China above, a conceptual

framework is to be introduced, which summarizes and possibly generalizes the findings in this regard. Understanding of the three immediate causes and underlying socioeconomical and cultural mechanisms of son preference such as the requirement of labor supply which contribute to an abnormally high sex ratio at birth, one next will think about the question how people choose one of three immediate options to reach their ends. To answer this question, a simplified threshold hypothesis is designed with three thresholds that correspond to the three immediate causes to measure the intensity of each choice. It suggests that until the threshold or the intensity for the choice is reached, people are assumed not to choose the method. The three thresholds are underreporting threshold, sex-selective-abortion threshold, and infanticide-mistreatment threshold.

Because a live infant has experienced a full term of pregnancy of 10 months as well as a crucifying delivery of the mother, the physiological and psychological pain caused by killing this infant or mistreating it to death, is then extremely high. In comparison, a sex-selective abortion during the middle of pregnancy is painful for the pregnant woman, but it ought to be less painful and less costly than the infanticide.

The threshold of underreporting measures the courage and determination of a person who has a female live birth but omitted it in survey or census, say, for a return of the chance to get a male birth in future. This threshold is mainly decided by a combination of the prevalence of son preference, the various administrative measures such as economic cost of underreporting and legal responsibility, and the social pressure and individual attitude of dishonesty. The underreporting threshold is definitely lower than the infanticide-mistreatment threshold, for it is only a problem of conscientiousness of concerned individuals, and has low cost such as pain. Comparing with the sex-selective-abortion threshold, the underreporting threshold is, however, indecisive and it could be either high or low. This is mainly determined by varying time at which the pregnancy terminates in a sex-selective abortion and additionally by different mental feeling prior to an induced abortion. In general, with low prevalence of modern sex-selective techniques, the three thresholds may following in order: underreporting $<$ sex-selective abortion $<$ Infanticide. Yet with high prevalence of modern technology such as Ultrasound B machine the order seems to be, sex-selective abortion $<$ underreporting $<$ infanticide threshold.

From a point of view of maximizing utility, an individual should choose a method, of which the threshold is the lowest. A population is heterogeneous and consists of various these individuals. The dynamics of the choice of a population, beyond a simple average, lies in the fact that it is determined by its overall developmental level. Unlike the conventionally referred economic development, the development, used in the framework as an important variable, implies the combination of economic development, social development, and the cultural development. The degree of industrialization, and the advancement of sci-

ence and technology indicates the degrees of economic development. The institutional settings and social structure, community construction, and education level of society, all adjust for the economic development. The inertia of traditional society and the prevalence of traditional ideology and preference, in turn, determine the culture development. The proposed conceptual framework of change in sex ratio at birth is that, for a population of which fertility declines to a low level, particularly in a rapid pace, as the developmental level increases from low to high level, the sex ratio at birth may change from the normal level, to the abnormal high level for boy preference, and finally to the normal level again later in time when the son preference diminishes along with development. The persistence of abnormally high sex ratio at birth by time is considered as an outcome of the time adjustment of cultural development for the economic development through the social process and social development. That is, different levels of development consisting specific economic, social, and cultural developments will bring different lgngth of abnormal sex ratio by time.

The height and magnitude of abnormal sex ratio at birth is determined by the thresholds of population in an aggregate sense, by the selection of desired sex of children, and additionally and more importantly by the speed of fertility decline. If the aggregate threshold is low, and the decline of fertility rapid, the abnormal sex ratio will be highest for strong son preference. In contrast, if all individual thresholds are high, and the fertility decline is slow, the sex ratio at birth will be normal, and longitudinally has nothing to do with development. An important fact implicit in the framework is that the development presupposes the time flow. Namely, the conversion from the increment in development to the increment in time is linked through the speed or growth rate of development. Moreover, the developmental level also affects the height of sex ratio at birth through the change in the aggregate threshold which is in turn a function of cultural development, measured particularly by the intensity of sex preference.

The reasonable assumption made in the framework is that while fertility declines, people with boy preference will stress on the quality of children. i.e. the desired sex, for an exchange of the quantity of children through allowable thresholds. However, when development rises to a high level, the various reasons of sex preference will loss the economic and social grounds, and the exchange of " quality" for "quantity" will gradually disappear, and the sex ratio at birth will then be normal again. The first stage of normal sex ratio at birth is one with traditional setting and high fertility. The second stage of abnormally high sex ratio at birth is transitional in nature and with relatively low fertility. And the final stage of normal sex ratio is of post −modernization and low fertility.

The proposed conceptual framework can be illustrated in some typical cases. The first case is that sex ratio at birth rises gradually to a high level, and the time to absorb this high ratio is long. This is a typical case for

places where (1) fertility decline is rapid and son preference strong and persistent; (2) the time of cultural development to adjust to economic development through social development is short. This is applicable to the populations with strong son preference, rapid fertility decline, and sluggish development.

The second case, in contrast to the first case, shows a sharp and rapid rise in sex ratio at birth for a short period of development. It is when the fertility decline is dramatic, and the son preference is extremely strong, while the adjustment period of development is also extremely short. This is the case for the populations with good awareness of the rise in sex ratio at birth due to, on one hand, the decline in fertility and a strong son preference and, on the other hand, the profound understanding and regulation of the various thresholds for increase in sex ratio at birth. This case may be also suitable to countries with perfect legal systems and sound administrative regulations and mechanism in effect.

Should the proposed conceptual framework as discussed above, be acceptable, what conclusions one may make? Firstly, it appears that the increase in sex ratio at birth will decidedly disappear, sooner or later, and return to the normal in the future after social adjustment for ideology and practice. Secondly, the framework describes explicitly the transition of people's attitude and practice from family-oriented considerations to individual-oriented considerations. This transition characterizes virtually the progression from family planning with normal and then abnormal sex ratios under high and low fertility schemes to the reproductive health of normal sex ratio under low fertility. From this point of view, the increase in sex ratio at birth could not be simply viewed as an unlucky result of family planning program, it seems more appropriate to consider it as an outcome of the biased balance of the social good and the individual right under high prevalence of individual right and choice. Society and culture, however, will evolve, so does the mind of an individual. Strengthened economically, people will liberate themselves from various family duties such as considerations of old-age support and dowry, and increasingly pay more attention to themselves and concern more about their reproductive health.

V. Policy Implications and Recommendations

The imbalance of births between males and females will potentially bring about a lot of consequences in a society. One of them which attracted much concern is the so-called " marriage squeeze". If the phenomenon of abnormal high sex ratio at birth remains in a society for long, males will be in excess of females in numbers, which will inevitably result in an aberrant age-sex structure of population in the Chinese society in the 21st century. Many men when they grow to the marriageable ages will find themselves in a situation difficult to match a spouse of compatible age, which may affect the stability of the society. The counter-argument against this assertion not rarely expressed however,

is that society will have a way to adjust it in the future as in the case of many post-war countries, the issue therefore does not need to be concerned today, which may reduce people's concern about the issue for an urgent solution.

More serious implication of the issue is very much related with the status and well-being of females at home and in society at large. Gender discrimination against female births and infants is a serious violation of the fundamental human rights of women and children. It does not conform at all to the principle of gender equality in modern civilization, and should be taken seriously by the government and society at large. Although for a country like China with tremendous population growth, a strict population policy is still necessary in place, it does not mean that any possible negative effects in the endeavor to women's status and well-off can be ignored.

This issue had not for some time received adequate attention in the population and family planning program as it deserves. Conceptually fertility transition has long been viewed as a single dimensional process from high fertility to low fertility, which focuses almost solely on change in level of fertility, often measured by the number of children born per woman in life. Should fertility transition be regarded as an integral part of the overall transition from traditional society to modern society, it may be observed as a multi-dimensional process, which includes not only level of fertility, but also timing of childbearing, and sex of birth (Gu, 1992; Ng and Gu, 1994). When fertility declines rapidly in terms of number of children a couple is to have, the tradition of strong preference for sons over daughters probably will become more salient, socio-cultural factors will be likely more influential than economic factor to dominate people's fertility behavior. This is probably why the patterns and trends of abnormal sex ratio at birth are not only observed in China but also in some other Asian populations with similar culture and rapid fertility decline. For example, the imbalance of males and females at birth and young ages in the Republic of Korea "is, in part, attributable to the fact that the pace of fertility reduction had been faster than the pace at which the parental male preference has been weakening" (Lee and Cho, 1992).

Accordingly, the population and family planning program should be implemented not only in its efforts to low down the fertility but also to have balanced sex ratio of births. The performance of the program should be evaluated not only in terms of fertility level, growth rate, and contraceptive prevalence, but also the degree of son preference in fertility behavior. In recent years, Chinese government has began to pay great attention to the issue. Mm. Peng Peiyun, the State Councillor and Minister of State Family Planning Commission of China, has reiterated to raise the awareness of having a balanced sex ratio of births as an important part of the population and family planning program. In Zhejiang province where the sex ratio at birth is one of the highest in China, the Provincial Family Planning Commission since

1993 has adopted sex ratio at birth as one of the criteria in the evaluation of the performance of the program, which greatly raised the attention of local leaders to the issue.

More fundamentally, to curb population growth and meanwhile have a balanced sex ratio at birth, the strategy of "beyond family planning" is recalled. Family planning program should be implemented with close incorporation with improvement of women's status and MCH program. They should be regarded as three major components of the concept of reproductive health, which requires the population and family planning program toward year 2000 to be implemented as "service oriented, people concerned, women sensitive, and rural emphasized".

The study of the abnormal sex ratio at birth as one of new emerging issues along with rapid fertility decline is only at its early stage. More systematical field investigation with combination of qualitative and qualitative methods is required to further our understanding of the various social, economic, and cultural factors which determine people's son preference in childbearing, particularly in the low fertility setting of developing societies. Since similar pattern and trend in sex ratio at birth observed in a number of Asian populations in recent years, comparative study of the populations with similar issue but different institutional and political context will be extremely beneficial. The research results to be generated from these studies will not only be helpful to the populations in eventually eradicating the unpleasant phenomenon, it may also be of reference to the populations which may encounter the problem when its fertility further declines in the near future.

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