한국인구학 제21권 제1호(1998): 184~228 한국인구학회

SON PREFERENCE AND FAMILY BUILDING DURING FERTILITY TRANSITION
IMPLICATIONS ON CHILD SURVIVAL

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This study reviews the relationship between son preference and fertility behavior, and infant and child mortality in the context of fertility and mortality decline. In Korea the situation reveals that fertility can decline to a very low level even in the presence of strong son preference, but son preference has certain effects on fertility and childhood mortality. The effect of son preference on fertility increased as the level of fertility declined.

Our findings show that son preference causes excess female childhood mortality both directly and indirectly through fertility. Also, in Korea, the analysis reveals that female children suffer excessively high level of mortality and part of the excess mortality is due to parents' behavior on family building related to the effort to secure the birth of a son.

1. Introduction

Parental preference for sons over daughters has been observed in countries with strong patrilineal family systems, such as those in East Asia and South Asia (Arnold and Kuo, 1984; Arnold and Liu, 1986; Cleland, Verrall and Vaessen 1983; Freedman and Coombs 1974; Nag 1991; Park 1978, 1983; Williamson 1976).

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In strong patrilineal systems, sons are valued for their potential roles in economic and social support of the parents and for their role in the succession of the family line. Some religious beliefs about sons and daughters and some social customs, such as dowry systems, are believed to result in son preference as well (Nag, 1991). Son preference is often measured in terms of intended fertility such as ideal numbers of sons and daughters, differences in the desire for more children depending on the number and sex combination of surviving children, and the preferred number and sex combination of additional children.

It is therefore natural to expect that son preference would have effects on fertility behavior. For example, couples who feel that they must have a certain number of sons would continue to have children until their desire is met. Obviously the effect of son preference on fertility would depend on the strength of preference. At the population level, the effect would also depend on the level of fertility. When fertility is high, most couples are likely to have the minimum number of sons they desire before they consider limiting fertility (Sheps, 1963; Arnold, 1987). If we assume that the sex ratio at birth is constant at 1.05, for example, percentages of couples with no sons would be 48.78 among those with one child, 23.80 among those with two children, 11.61 among those with three children, and 5.66 among those with four children. If most couples wait until they have four children to consider limiting fertility, only 5.66 percent of the couples face the problem of not having a son yet. If couples consider limiting fertility after having two children, 23.80 percent face the problem of not having a son. Thus, the effect of son preference on fertility would increase if most couples consider limiting fertility at lower parities rather than at higher parities.

In addition, the effect of son preference will probably change during fertility transition because there is likely to be an association between a couple's attitude on son preference and their adoption of behavior to control fertility. At the beginning of the fertility transition, the couples who adopt family planning

are likely to be those with modern attitudes in general and less likely to have strong son preference. During the later stages of the fertility transition, the norm of small family size would spread to include couples with a strong son preference. When the couples with strong son preference adopt fertility control, their behavior such as deciding whether or not to use contraceptives and the choice of contraceptive method is likely to reflect son preference.

Infant and child mortality is known to be affected by fertility through birth interval, birth order, and sex composition of older siblings(Aaby, 1988; Das Gupta, 1987; Hobcraft, McDonald and Rutstein, 1985; Muhuri and Menken, 1993; Muhuri and Preston, 1991; Pebley and Stupp, 1986, Palloni and Milman, 1986; Retherford and others, 1989). These factors are also found to be associated with sex differentials of infant and child mortality(Choe, Hao, and Wang, 1995; Das Gupta, 1987; Muhuri and Preston, 1991). In this chapter we examine the effect of son preference on fertility and then discuss its potential implications on infant and child mortality during fertility transition.

First we use previous studies to review the relationship between son preference and fertility behavior in East Asia and South Asia with reference to the level of fertility. Then, using the Republic of Korea as an illustration, we closely examine the effect of son preference on fertility in the context of fertility transition. We also examine the implications of the fertility behavior caused by son preference on childhood mortality. Korea provides an interesting setting to study the effect of son preference on fertility and sex differentials of infant and child mortality for several reasons. Korea has undergone rapid changes in socioeconomic conditions and rapid decline of fertility and mortality in the recent past(Cho, Arnold and Kwon, 1982; Choe and others, 1995; Coale, Cho, and Goldman, 1980). Comparative studies have documented that son preference is very strong in the Republic of Korea(Arnold and others, 1975; Arnold and Kuo, 1984; Williamson, 1976). The strong son preference continues in the Republic of Korea even after economic developments, increased female education, and fertility decline to below-replacement level(Cho, Arnold and Kwon, 1982; Chung,

Cha and Lee, 1974; Park and Cho, 1995). The son preference attitude in Korea has been found to affect both fertility (Arnold, 1985; Choe and others, 1995; Park 1978, 1983; Park and Cho, 1995) and sex differential in infant and child mortality (Choe, 1987; Park 1955; Park and Park 1981).

2. Measuring the Effect of Son Preference on Fertility

Measures of fertility used to examine the effect of son preference can be grouped into three categories: (a) intended fertility; (b) fertility control; and (c) parity progression. We review studies on effects of son preference on these measures; on desire for additional children as a measure of intended fertility; on use of contraception and induced abortion as measures of fertility control; and on parity progression. We focus on the numerous studies of India, Bangladesh, China, and the Republic of Korea, the countries that have been identified as having strong son preference.

1) Desire for Additional Children

The desire for additional children has been used most widely to examine the impact of son preference on fertility (Arnold, 1985, 1987; Arnold and Liu, 1986; Cleland, Verrall and Vaessen, 1983; Nag, 1991). Arnold proposed a simple systematic method of measuring the impact of son preference on fertility (Arnold, 1985, 1987): based on the table of proportions of couples who want no more children (or any other indicator of intended or actual fertility) by parity and sex combination of surviving children, he estimates the potential increase in the proportion of couples who do not want any more children in the absence of sex preference.

Arnold (1987) applied the method to 35 sample surveys from 22 countries collected during 1965-84 throughout the world. On the average, the proportion

of respondents who do not want more children would increase by 4.5 percent if the sex preference were to disappear suddenly. Arnold points out that the small effect is partly due to the biological process: at each parity, the proportion of couples who do not have any sons is relatively small. In addition, the method may result in an underestimate because the couples of strong son preference are likely to be concentrated in the high parity group because couple's past fertility would have been affected by son preference (Arnold, 1987; Bairagi, 1987). Nevertheless, it is notable that the estimated effects are high in countries known to have strong son preference: India, Nepal, the Republic of Korea, Taiwan, and Turkey. India (in 1970) and Taiwan (in 1967) showed the largest effects at 8.9 percent.

The desire for more children is one element in the process of additional fertility and is a good measure of son preference when it is related to the numbers of surviving sons and daughters. It is not an ideal measure of fertility, however, because there are many steps required to transform the desire for more children to actual fertility, or to avoid undesired fertility successfully.

2) Contraceptive Use and Method Choice

Contraception is the most efficient way of controlling marital fertility and information about current use of contraception from most of the populations around the world is collected and published regularly. It is not surprising therefore that many studies analyzed the contraceptive use data as a measure of fertility to examine the effect of son preference. Arnold suggested a systematic approach, similar to the one he used to analyze the desire for more children. When the method was applied to 41 surveys from 27 countries, the effects were found to be small in general. He found that eliminating sex preference would increase the contraceptive prevalence rate of women by 3.7 percent on the average. Nevertheless, the estimated effect was relatively large in countries known for high level of son preference: the Republic of Korea,

Taiwan and Egypt (Arnold, 1987).

China presents an interesting case. The level of son preference is thought to be high in China due to the tradition of Confucian patrilineal family system. The estimated effect of son preference on use of contraception, however, is very small according to the analysis by Arnold. He estimated that the contraceptive prevalence rate in 1982 would increase from the observed level of 70.9 percent to 72.7 percent in the absence of son preference (Arnold, 1987). A calculation based on the tabulation of 1988 survey data[1] gives a similar result: the contraceptive prevalence would increase from the observed level of 68.9 percent to 70.7 percent in the absence of son preference. The small effect may be due to the possible errors in the data. In China, birth planning has been a national policy of high priority since 1974 and the Government strongly recommends married couples to adopt specific birth control methods (Hardee-Cleveland and Banister, 1988; Kaufman and others, 1989; Zeng, 1989). The fertility surveys used for the analysis of son preference were carried out by the same organization responsible for the administration of the family planning programs. It is, therefore, possible that when women were asked about their contraceptive use in a face-to-face interview, they responded according to what they were supposed to be doing instead of what they were really doing.[2] Such behavior would result in some women reporting use of contraception when they are not actually using, especially if they already have one or two children but no sons.

Some studies used multivariate analysis to examine the relationship between son preference and use of contraception. Typically, the effect of "having a surviving son" on the current use of contraception is estimated by a

1) Unpublished tabulation by Minja Kim Choe at East West Center, December 1994.

2) Hermalin and Liu reports that responses to questions on family size preferences in China show evidences of under reporting in face to face interviews (A. I. Hermalin and X. Liu, "Gauging the validity of responses to questions on family size preferences in China, in Population and Development Review, vol. 16 (New York, 1990)).

multivariate causal model controlling for effects of other covariates such as woman's age, parity, level of education, and residence. The multivariate approach has at least two advantages. First, it provides a quantitative measure of the effect, which can be tested for a statistical significance. Second, because the multivariate method provides the net effect of son preference while controlling for other potential covariates of contraceptive use, the problem of heterogeneity can be taken care of to a large extent.

A follow-up study in a rural area in Bangladesh (Matlab Treatment Area) found that both the acceptance and continuation of contraception increased substantially with the number of surviving sons (Rahman, Akbar and Phillips, 1990). An analysis of national survey data collected in the Republic of Korea in 1974, 1982, 1988, and 1991 found that in all of the surveys, having a surviving son was the most important factor in determining contraceptive use and method choice (Suh and Cho, 1993).

A study of women in rural Jilin province in China found that whether or not a couple had a surviving son had a statistically significant effect on the probability of using contraception, as well as the choice of contraception. The effect of son preference on contraceptive use, however, was small. Among rural Jilin women who are exposed to conception, having a surviving son increased the probability of using any contraceptive by 3.2 percent controlling for other factors (Choe and Tsuya, 1991). The effect of having a surviving son on the choice of contraceptive method, however, was much stronger: the probability of using sterilization increased by 51 percent among women with one child and 74 percent among women with two or more children. It is not surprising because although Chinese women's responses on contraceptive use may not be reliable, the reports on sterilization are less likely to suffer from over-statement due to its permanent effect.

Though contraceptive use is a more concrete measure of fertility than the intention to have more children, it is still an incomplete measure of fertility. Factors other than contraception can have a large effect on fertility and these

factors can also be affected by son preference. For example, induced abortion is a major component of fertility control that can also be affected by son preference. Other factors, such as breast-feeding and abstinence are also parts of fertility control which may be affected by son preference. These factors, however, contribute only a small portion to fertility control and we will not discuss them in detail.

3) Use of Induced Abortions

In many populations, fertility is controlled by use of induced abortions to a great extent. China and the Republic of Korea stand out as countries with high induced abortion rates and high level of son preference. Arnold and Liu (1986) reported that 16 percent of conceptions in the 1979~81 period were terminated by induced abortions. They also found that the abortion ratio (ratio of abortions to births) was higher among those who had a son than among those who did not. Of women who had two to five children, the abortion ratio of women who had a son was at least double that of women who did not have a son. According to this study, the effect of son preference was larger on induced abortion than on contraceptive use around 1980. As fertility continued to decline in China, the abortion rate increased. Wang estimates that 22 percent of pregnancies in China during 1985~87 were terminated by an induced abortion. Further, the probability of ending a pregnancy by induced abortion was about three times higher among couples with a surviving son than among couples without a surviving son after controlling for the woman's age at conception, residence, education, occupation, and total number of surviving children (Wang, 1994). We can conclude that both the abortion rate and the role of induced abortions in the link between son preference and fertility increased in China during fertility decline.

Choe and Han estimated the net effect of "having a surviving son" on the probability of terminating a pregnancy by induced abortion in the Republic of

Korea, controlling for the effect of other covariates. They found that among pregnancies in 1977-86, the probability of inducing an abortion among couples with a surviving son was about double that among couples with no surviving sons(Choe and Han, 1994). Furthermore, although the induced abortion rate was much higher among those who had achieved ideal family size than among those who had not, the effect of "having a surviving son" was about the same for these two groups of women. Among women who already had their ideal number of children(or more), the proportion of pregnancies ending in induced abortion was 71 percent if a woman had at least one surviving son and 35 percent if a woman had no surviving sons. Among women who had not reached their ideal family size, the proportions were 37 percent and 19 percent.

4) Parity Progression

The effect of son preference on fertility can be measured most directly by relating a couple's actual fertility dynamics to the presence or absence of surviving sons. At a given parity, if the probability of having additional children(parity progression ratio) is higher for couples without surviving sons than for couples with surviving sons, it can be interpreted as evidence of son preference. An unbiased analysis of parity progression requires a follow-up observation of women for a period of time or reliable retrospective birth histories. In Bangladesh, Chowdhury and Bairagi(1990) analyzed parity progression in the Matlab Experimental and Comparison Areas, where a prospective observation of women's reproductive behavior has been carried out for many years. They analyzed the births for a three-and-half year period starting July 1982, and found that in general the proportion of women giving births during this period decreased with the number of living children and the number of living sons, and that among women with three or more living children, the smallest proportion going on to have more children were those

with one daughter. The differential was much larger in the Experimental Area than in the Comparison Area. The contraceptive prevalence rate was 46 percent in the Experimental Area and less than 23 percent in the Comparison Area at the end of 1984. The study concludes that son preference has a large effect on fertility in rural Bangladesh and the effect was greater in the area with higher contraceptive prevalence rate.

Das(1987) analyzed the parity progression among women in south Gujarat, a western state of India, from a retrospective fertility survey conducted in 1979-80. He found that the number and the sex combination of surviving children are statistically significant factors of parity progression both in urban and rural areas, controlling for duration since last birth, woman's education, woman's age at the beginning of exposure, and socioeconomic status of the household. He also found that the effect of number and sex combination is larger in rural area than in urban area.

In the Republic of Korea, the effect of son preference on fertility has been analyzed more extensively. In the analysis of a survey data collected in 1971, Park(1978) found that the progression to fourth child did not depend on the number of surviving sons before 1965 but after 1965 the association between the number of living sons and progression to the fourth parity became statistically significant. The Republic of Korea initiated the national family planning program in 1962 when the contraceptive prevalence rate was about 10 percent, and by 1965 the contraceptive prevalence rate among women in reproductive ages rose to 20 percent(Cho, Kong and Lee, 1984, table 8). As fertility declined, the effect of son preference on parity progression began to have statistically signific ant effects at lower parities. By 1974, the effect of son preference was statistically significant at progression to third births(Park, 1983). In 1991, the effect of son preference was statistically significant at progression to second births as well(Cho and Ahn, 1993). Cho and Ahn found that both the interval to next pregnancy, which is mainly affected by use of contraception, and the probability of terminating a pregnancy by induced

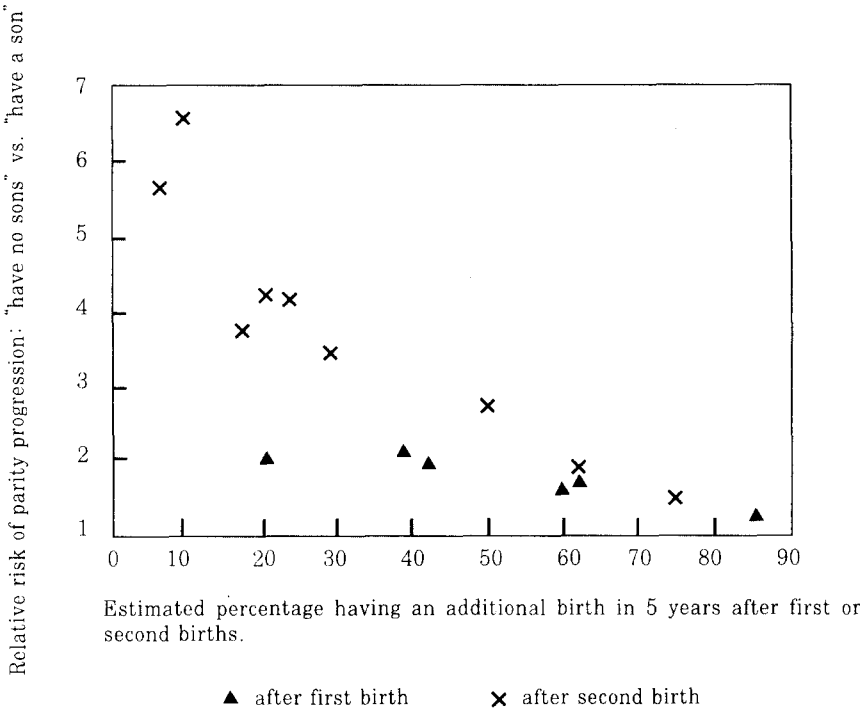
abortion were affected by the number of surviving sons.

China has a large population and a long tradition of a patrilineal family system. The socioeconomic conditions, as well as the levels of fertility and mortality vary greatly by geographic regions. These conditions, together with large scale survey data made available recently, provide an opportunity to examine the effect of son preference on fertility in reference to the fertility transition. Choe and others(1992) analyzed progression to second and third births in urban and rural parts of six provinces in China using the In-Depth Fertility Survey of 1987. Excluding some urban areas of provinces with very small populations from the analyses, they found that the effect of "whether a woman has a surviving son or not" on the progression to second and third births was statistically significant except in areas where the overall progression ratio was less than 10 percent or greater than 90 percent.

The relationship between the effect of son preference and the estimated probability of having an additional birth in 5 years after previous birth in different areas is summarized in figure 1. It shows that the relative risk of going on to have additional children, depending on whether a woman has a surviving son or not, is larger when the overall proportion of women having an additional birth is smaller. When the effect is interpreted in terms of the differences in the probabilities of parity progression, the relationship takes an inverted "U" shape: the effect is small when the overall ratio is very low or very high, and it is large when the overall ratio is at intermediate level(figure 2). It should be noted that because the parity progression ratios have upper and lower limits(1 and 0), the additive effect cannot be large near the limits.

Based on the preceding reviews, we make the following tentative conclusions. The first conclusion concerns the methodological aspect. Although data on the desire for more children, use of contraceptive methods, and use of induced abortions provide useful insights into components of fertility, the overall effect of son preference on fertility can be measured most clearly by parity progression ratios. Because the sex combination of surviving

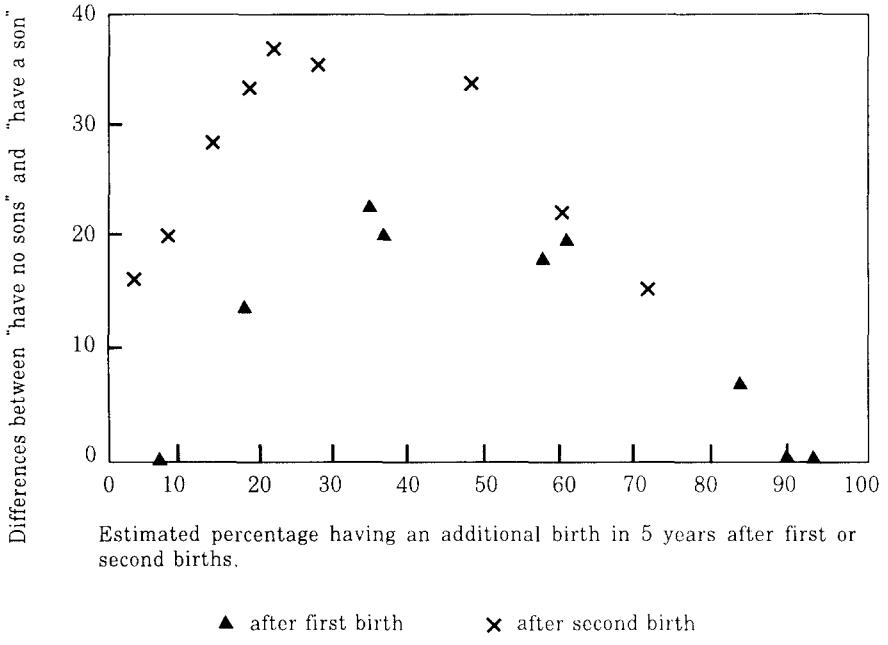
〈Figure 1〉 The relationship between overall parity progression ratio and the effect of son preference measured by the relative risk: six provinces in China, 1977~1987



Source: Choe, M. K. and others, "Progression to second and third births in China: patterns and covariates in six provinces", *International Family Planning Perspectives* (New York, vol. 18, 1992), tables 2-3.

children is affected by past fertility, which in turn has an effect on son preference, a multivariate statistical method to measure the effect of son preference is preferred, controlling for other covariates likely to be associated with past fertility. Among the various multivariate models, we prefer the hazard model to analyze the parity progression because the probability of birth depends on the duration of exposure, and survey data are likely to have censored observations. The effect of son preference on fertility should be measured by an indicator most appropriate for the measurement of fertility. If

〈Figure 2〉 The relationship between overall parity progression ratio and the effect of son preference measured by the difference in ratios: six provinces in China, 1977-1987



Source: Choe, M. K. and others, "Progression to second and third births in China: patterns and covariates in six provinces", *International Family Planning Perspectives* (New York, vol. 18, 1992), tables 2-3.

the measure of fertility is a probability or proportion of having more children, it is more appropriate to measure the effect by relative risks or odds ratios rather than by differences in the probabilities or proportions. If the measure of fertility is number of children, the effect can be measured by the difference.

In general, the effect of son preference on fertility increases with declining fertility when the effect is measured by the probability of having additional children. The nature of son preference in South Asia is somewhat different from that in East Asia. Although sons are preferred over daughters in South

Asia, most couples seem to desire to have at least one daughter as well(Chowdhury and Bairagi, 1990; Das, 1987). There is no evidence of the necessity of having a daughter in China and the Republic of Korea. Whether the desire for at one daughter observed in South Asia is mainly the reflection of higher desired family size than observed in East Asia, or is based on special values of daughters is not clear from our review.

3. Consequences of Differential Fertility Caused by Son Preference and their Implications on Child Survival

The most obvious consequence of the differential fertility caused by son preference is that a female child is much more likely than a male child to be followed by a younger sibling after a short interval. Studies on the determinants of child survival have identified the birth of a younger sibling following a short interval as one of the most important factors associated with childhood mortality(Hobcraft, McDonald and Rutstein, 1985; Pebley and Stupp, 1986; Palloni and Millman, 1986; Retherford and others, 1989). Therefore, in the presence of son preference, female children would suffer higher level of childhood mortality than male children partly because they are more likely to have a younger sibling born within a short interval.

The short birth interval increases mortality risks of both the children born before and after the interval. The interval following a birth is an important intermediate variable linking son preference and sex differential of the infant and child mortality because whether a next child is born at all or is born after a short interval depends on the sex of a child. The role of preceding birth interval in the link between son preference and infant and child mortality is not clear because, in general, the birth interval cannot be determined by the sex of child following the interval.

Fertility affects sex differentials of infant and child mortality through the

sibling size and family composition as well. Because of the effect of son preference on parity progression ratios, mean number of siblings is larger for female children than male children where there is son preference (Park and Cho, 1995). The larger mean number of siblings for female children than male children can result in higher female infant and childhood mortality. On the average, female children have to compete with more siblings than male children for parental attention and for resources for survival, and therefore are likely to experience higher mortality risks. Female children, because of larger mean sibling size, are also more likely to live in a crowded household than male children, may contract infectious disease more easily, and therefore experience higher mortality than male children. At family level, parental discrimination against female children in allocation of food and health care is more likely to be practices among those with large number of children then among those with fewer children (Caldwell, Reddy, and Caldwell, 1988; Chen, Huq, and D'Souza, 1981; Das Gupta, 1987; Rahman and others, 1982). In India, Bangladesh, China, and Korea, excess female mortality is found to be more prevalent among those who may be considered excessive by their parents such as those who have elder sisters (Choe, Hao, and Wang, 1995; Das Gupta, 1987; Muhuri and Preston, 1991).

Recently, techniques for identifying the sex of a fetus have become widely available. Most countries have rather restrictive laws to prevent the use of this technique purely for the purpose of sex identification (Choe and Han, 1994; Park and Cho, 1995; Zeng and others, 1993). However, some couples, desperate to have sons and not to have additional daughters, may use these techniques to identify and abort female fetuses. There are evidences that such practices resulted in an abnormally high sex ratio (number of males over females) at birth in China and the Republic of Korea (Zeng and others, 1993; Park and Cho, 1995). In these countries, because the sex selective abortion is likely to be used at later parities, the sex ratio increases with birth order. The differential sex ratio by birth order may affect the sex ratio of mortality, mainly because mortality

is higher for the first born children. High mortality associated with very high birth order is not likely to affect sex ratio of mortality because only very small number of high order births are expected in these populations.

Controlling for the birth order effects of childhood mortality, the unusually high sex ratio at birth, resulting from selective abortions of female fetuses, may result in reduction of sex differentials in infant and child mortality. Most of the excess female infant and child mortality results from unequal treatment of female children in food allocation and health care based on lower value of female children to parents. It is therefore likely that if parents have only the children they desire including some female children, these female children would experience less discrimination from parents and would not be subject to excessive childhood mortality. Eliminating the births of unwanted female children, however, is not likely to eliminate the excess female mortality completely. Some of the excess female mortality may originate from differential child rearing customs for male and female children associated with deeply rooted cultural or religious practices, rather than from conscious differential treatment by parents. Sons and daughters who are equally desired may be treated differently because parents desire different characteristics in their daughters and sons. For example, daughters may be taken to doctors less frequently than sons because parents do not think it desirable to expose their daughters. Excess female mortality resulting from such differential child rearing practices would be more difficult to eliminate, even when only those female children who are desired by their parents are born.

4. A Case Study: the Republic of Korea

The family system in the Republic of Korea is based on Neo-Confucian ideology which emphasized the patrilineal succession of family line (Deuchler, 1992). In the Korean family system the role of eldest son, with his

unconditional right to inherit the family headship, is particularly important. Until the most recent changes of the family laws in 1991, families without sons could preserve the family line only by an adoption of a male heir who was a paternal blood relation belonging to the same generation as the missing son. The importance of a biological son in the preservation of the family line is believed to have resulted in the strong son preference in the Republic of Korea (Deuchler, 1992; Chung, Cha and Lee, 1974). Evidence of this son preference has been documented in terms of the ideal number of children and fertility related behaviors discussed in the previous sections. Additional indications of son preference are shown in table 1.

Since 1960, the Republic of Korea has experienced a rapid fertility decline as shown in figure 3. The estimated total fertility rate (TFR) was 6.0 in 1960 (Coale, Cho and Goldman, 1980), which dropped to 2.1 in 1983 (Korea National Bureau of Statistics, 1989), and has been at below replacement level since 1984. The estimated TFR for 1990 is 1.6 (Kong and others, 1992). The family planning programs in Korea emphasized information, education, and communication (IEC) programs and easy access to family planning supplies and services through the network of national public health programs. The family planning policy makers have been aware of strong son preference in Korea, and the IEC programs were designed to eliminate son preference attitudes (Cho, Arnold and Kwon, 1982; Cho, Suh and Tan, 1990). Surveys during the 1980s and 1990s document, however, that although preferred ideal family size by women was reduced to two children, son preference attitudes persisted in a large segment of the population. For example, in a national survey conducted in 1991, forty one percent of women of child-bearing age answered positively to the question, "Do you think it is necessary for a married couple to have a son (table 1)?"

〈Table 1〉 Indicators of son preference in various surveys: Republic of Korea, 1959~1991

Year	Survey and Source	Indicator	Index
1959	Six rural villages	Percent of adult men who would get another wife if first wife does not produce a son	41
		Percent of adult men who would adopt a son if first wife does not produce a son	34
1971	Korea Institute for Research in Behavioral Sciences	Percent of married women of child bearing ages who would let husband get a second wife if first wife does not produce a son	50
		Percent of married women of child bearing ages who would continue having children until a son is born	53
1985	Fertility and Family Health Survey	Percent of married women of child bearing ages who consider that it is necessary to have a son	39
1990	Six rural villages	Percent of adult men and women who think that husband should get a second wife if the first wife does not produce a son	24
		Percent of adult men and women who think that a couple should adopt a son if wife does not produce a son	34
1991	Fertility and Family Health Survey	Percent of married women of child bearing ages who consider that it is necessary to have a son	41

Sources: 1959: Ko, Huang Kyong and others, "A study on Korean rural family" (Seoul, Rep. of Korea, 1963), p. 141;

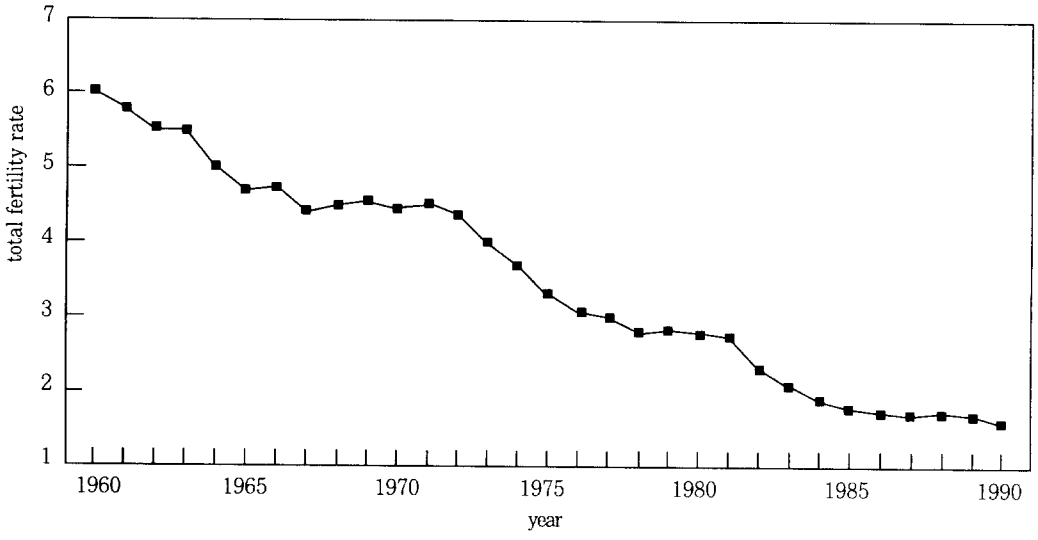
1971: Chung and others, in *Psychological Perspectives: Family Planning in Korea* (Seoul, Rep. of Korea, 1972), p. 410;

1985: Korea Institute for Population and Health, *1985 Fertility and Health Survey* (Seoul, Rep. of Korea, 1985), p. 59;

1990: Kim, N. L., S. Choi and H. Park, "Rural family and community life in South Korea: changes in family attitudes and living arrangements for the elderly, in *Tradition and Change in the Asian Family*, L. J. Cho and M. Yata, eds., (Honolulu, Hawaii, East-West Center, 1995), p. 286;

1991: Kong, S-K. and others, *Family Formation and Fertility Behavior in Korea: 1991 Fertility and Family Health Survey* (Seoul, Rep. of Korea, 1992), p. 128.

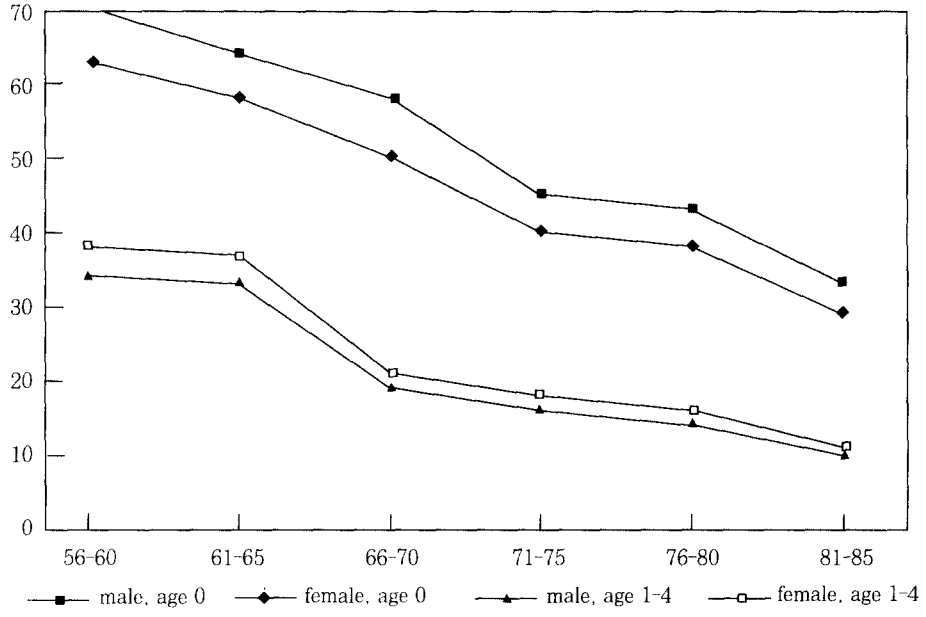
〈Figure 3〉 Total fertility rates in the Republic of Korea: 1960~1990



Sources: Coale, A., L-J. Cho and N. Goldman, in *Estimates of Recent Trends in Fertility and Mortality in the Republic of Korea*, Committee on Population and Demography, Report No. 1 (Washington, D.C.: National Academy Press, 1980), table 1; Moon, H-S. and others, in *1988 Fertility and Health Survey* (Seoul, Korea Institute for Population and Health, 1989), table V-1; Kong, S-K. and others, in *A Study on Korean Rural Family* (Seoul, National University Press, 1992), table 9-1; Korea National Bureau of Statistics, *Outline and Major Results of the 1985 Population and Housing Census in the Republic of Korea* (Seoul, 1989); Korea National Statistical Office, *Population Projections for Korea, 1990-2021*, mimeographed (Seoul, 1991), p. 15.

Concurrent with the fertility decline, infant and childhood mortality declined in the Republic of Korea. Figure 4 shows the trends in infant mortality (probability of dying before age 1) and child mortality (among those who survive to age 1, probability of dying before age 5), estimated from the adjusted vital statistics, from 1956 to 1985. The infant mortality rate declined more than 50 percent and the child mortality rate declined more than 70 percent in 25 years. Throughout the period, infant mortality was higher for males than for females, and child mortality was higher for females than males. Obviously,

〈Figure 4〉 Infant mortality rate (age 0) and childhood mortality rate (ages 1-4): Republic of Korea, 1956~1985



Notes: The infant mortality is the probability of dying before age 1 and the child mortality i the conditional probability of dying before age 5 among those tho survive to age 1.

Source: Kim, N. I. *A Statistical Analysis of Death Registration in Korea* (Unpublished Ph. D. Dissertation, University of Hawaii, Honolulu, 1986), pp. 69-71; N. I. Kim, "Past trends and projections of mortality in Korea," in *Korea Institute for Population and Health, Population Problems and Their Counter-Measures in Korea* (Seoul, , 1990), pp. 70-71.

female children in Korea experience excess mortality at ages one through four. Although the infant mortality was higher for male children than for female children, the male-to-female ratio was much lower than the pattern observed in other populations and model life tables (Choe, 1987; Park and Park 1981), suggesting that female children in Korea suffer excessive mortality during infancy as well. Han and Kim (1990), who analyzed the infant and child mortality from pregnancy histories of women survey in 1988, found that in the 1980s, although the sex differential in infant and childhood mortality persisted,

the difference was not statistically significant. They estimated that among births during the 1983-88 period, the mortality before age 5 was 17(deaths for 1,000 live births) for male and 20 for female(Han and Kim, 1990). The lack of statistical significance should be interpreted with caution. Han and Kim tested whether male and female mortality were same or not. It is more appropriate to test whether the female mortality is higher than expected, which should be lower than the male mortality in the absence of sex preference.

1) Data

We use data from the 1991 *Family and Health Survey*(Kong and others, 1992) to analyze the effect of son preference on parity progression and its implications on childhood mortality. The survey collected complete pregnancy histories from 7,462 ever married women age 15-49 together with survival status of each child and dates of deaths for those who had died. From pregnancy histories, we examine progression to second, third, and fourth births. To examine the changes of effects of son preference in the context of fertility decline, we analyze the parity progression by three parity cohorts: before 1975, 1975-79, and 1980-84. The parity cohorts are defined according to the year women gave birth to first, second, third, and fourth births. We also examine the determinants of infant and childhood mortality before age 5, including the covariates related to fertility. Combining the results from the analyses of parity progression and childhood mortality we illustrate how son preference affects fertility in the context of fertility decline, and how the resulting fertility pattern affects childhood mortality in turn.

2) Son Preference and Parity Progression

We first examine the effect of son preference on fertility by comparing parity progression ratios of women with and without surviving sons. Table 2 shows

〈Table 2〉 Probabilities of having next birth in 7 years, by year of birth and birth order, and whether or not women have a surviving son in the Republic of Korea

Year of birth	Birth order	Number of women	Proportion with no sons	Probability (standard error)		
				All women	Have a son	Have no sons
Before 1975	1	1,778	47%	.9578 (.0048)	.9531 (.0069)	.9578 (.0048)
	2	1,417	27%	.7825 (.0110)	.7328 (.0137)	.9578 (.0048)
	3	788	15%	.5274 (.0178)	.4751 (.0193)	.9578 (.0048)
	4	300	12%	.4134 (.0286)	.3732 (.0299)	.9578 (.0048)
(Total Fertility Rate in 1975)				3.28		
1975-79	1	1,229	46%	.9274 (.0074)	.9155 (.0108)	.9414 (.0099)
	2	1,151	25%	.5339 (.0148)	.4387 (.0171)	.8151 (.0229)
	3	687	17%	.3314 (.0181)	.2415 (.0181)	.7694 (.0393)
	4	320	11%	.2291 (.0237)	.1846 (.0231)	.6053 (.0851)
(Total Fertility Rate in 1980)				2.72		
1980-84	1	1,547	47%	.8313 (.0096)	.7900 (.0143)	.8772 (.0122)
	2	1,326	24%	.2198 (.0114)	.1266 (.0105)	.5255 (.0286)
	3	554	18%	.1331 (.0145)	.0680 (.0118)	.4532 (.0518)
	4	208	16%	.1211 (.0227)	.0864 (.0213)	.3043 (.0803)
(Total Fertility Rate in 1985)				1.70		

Note: The probabilities are computed from pregnancy histories of women age 15-49 by a life table method using quarterly birth probabilities.

Source: Individual records from 1991 National Survey of Fertility and Family Health.

the estimated probabilities of having the next births in 7 years after first, second, third, and fourth births by parity cohort for women classified by whether or not they have a surviving son. Progression to next birth after more than 7 years was very rare and we can interpret the proportions in table 2 to be the eventual parity progression ratios. The progression to second birth was nearly universal (over 95 percent) among women who had their first birth before 1975. It declined to less than 85 percent among those who had their first birth during 1980-84. The most dramatic change is seen in the progression to the

third births. Among women who had the second birth before 1975, about three-quarters went on to have the third birth even when they had a surviving son. The proportion dropped to about 13 percent among those who had the second birth during 1980-84. Clearly, these trends resulted in rapidly declining fertility indicated by total fertility rates in the same table. We also see that the probability of having additional children among women with a surviving son differs from that among women with no surviving sons and that the differences vary by parity cohort. The difference is larger at higher parities than at lower parities in general, but as we move to the more recent parity cohorts, the differences at lower parities increase.

The effects of son preference on fertility are estimated next by a series of hazard models. At each parity, separate hazard models are estimated for different parity cohorts using whether or not a woman already has a surviving son or not as a covariate. The hazard models are used to estimate the net effect of son preference on parity progression controlling for effects of other covarites on parity progression. Other covariates included in the hazard models as potential determinants of parity progression are: maternal age at previous birth, years of formal education, residence, childhood residence, and whether a woman answered positively to the question "Do you think it is necessary for a married couple to have a son?" We limit our discussion to the effects of two covariates related to the son preference: whether or not women had a surviving son and whether women agreed with the statement that it is "necessary to have a son." The complete descriptive statistics and results of hazard models are shown in the Appendix (tables A1-A6).

Table 3 shows the estimated relative risks associated with the covariate "have a surviving son" on progression to next parity from first, second, and third parities for three parity cohorts. The relative risk is the ratio of the probabilities of having next birth among those who have a surviving son and those who do not. All of the estimated relative risks are statistically significant at the 5 percent level. The effect on the progression to second birth (initial parity

〈Table 3〉 Estimated effects (relative risks) of the covariate "have a surviving son:" on progression to next parity by initial parity and parity cohort: Republic of Korea

Initial parity	Year women achieved the initial parity (parity cohort)					
	Before 1971	Number of women	1975-79	Number of women	1980-84	Number of women
1	0.8554	1,778	0.8466	1,229	0.8136	1,547
2	0.6036	1,417	0.3418	1,151	0.1675	1,326
3	0.3600	788	0.1949	687	0.1016	554

Note: The relative risks are net effects controlling for the effects of maternal age at previous birth, years of formal education, residence, childhood residence, and response to "must have a son" estimated by proportional hazard models using BMDP programs. See appendix tables A4-A6 for complete results of the hazard models.

All estimated effects are statistically significant at the 5 percent level.

Source: Individual records from 1991 National Survey of Fertility and Family Health.

= 1) is relatively small (the relative risk is close to 1.0) and it did not change much by parity cohort. The effect of son preference on progression to third birth was moderate for the pre-1975 parity cohort, but became very strong for the 1980-85 parity cohort. The effect of son preference on the progression to fourth birth is very strong for all parity cohorts.

Table 4 shows the relationship between women's attitude on the necessity of having a son and their probability of having another child based on the hazard model. All but one of the estimated effects are statistically significant. In general, the effects are smaller than the effects of the covariate "have a surviving son." Many factors can explain the relatively weak effects. First, a woman's response to the question reflects her attitude at the time of the survey, and not her attitude when she was exposed to parity progression to second, third, and fourth births, which may have been more than 15 years before the survey (before 1975). In particular, her attitude may have changed if she actually went on to have additional children and failed to have a son. Second, a woman may respond to the question by giving the answer she considers to be general norm rather than what she prefers for herself. Third,

〈Table 4〉 Estimated effects (relative risks) of the covariate "Do not agree" with "must have a son" on progression to next parity by initial parity and parity cohort, the Republic of Korea

Initial parity	Year women achieved the initial parity (parity cohort)					
	Before 1974	Number of women	1975-79	Number of women	1980-84	Number of women
1	0.8203	1,778	0.7919	1,229	0.7085	1,547
2	0.7731	1,417	0.6572	1,151	0.4961	1,326
3	0.8121	788	0.5923	687	0.5475	554

Note: The relative risks are net effects controlling for the effects of maternal age at previou birth, years of formal education, residence, childhood residence, and whether or no woman has a surviving son, estimated by proportional hazard models using BMDI programs. See tables A4-A6 for complete results of the hazard models.

All estimated effects except the one for initial 'parity = 3' and 'parity cohort = -1974' ar statistically significant at the 5 percent level.

Source: Individual records from 1991 National Survey of Fertility and Family Health.

a Korean woman's fertility behavior may not be determined by her own preference alone, but also partly determined by what she considers to be desires of other members of the family, especially her husband and her parents-in-law. According to the two hazard model analyses, the actual presence of a surviving son affects the probability of having additional children more strongly than reported attitude on the necessity of having a son in Korea.[3] If women who do not have surviving sons behave like those with surviving sons, the fertility in Korea would be even lower than the current level. In this sense, son preference may be considered to result in excess births. The impact of son preference on fertility is summarized in Table 5 in terms of excess births by birth cohort and birth order. It shows that the effect of son preference increased in the Republic of Korea as fertility declined from moderate to low levels because the decision to have more children moved to earlier parities.

3) Additional analyses, not reported here, show that the interaction of two factors, "have a surviving son" and attitude on the necessity of having a son, is not statistically significant.

〈Table 5〉 Predicted numbers of births, by birth order and year of previous birth with and without the observed level of son preference in the Republic of Korea

Parity cohort (Year of previous birth)	Birth order	Expected number of births		
		With son preference	Without son preference	Percent excess due to son preference
Before 1975	2	1,710	1,694	0.94
	3	1,097	1,038	5.38
	4	418	375	10.29
	2-4	3,225	3,107	3.66
1975-79	2	1,142	1,125	1.49
	3	614	505	17.75
	4	227	166	26.87
	2-4	1,983	1,796	9.43
1980-84	2	1,268	1,222	3.63
	3	302	168	44.37
	4	80	38	52.50
	2-4	1,650	1,428	13.46

Note: The numbers in the column "with son preference" are computed from the adjusted proportions of having next birth as shown in table A7. The numbers in the column "without son preference" are computed by applying the adjusted proportions of having next birth for women with a surviving son to all women for given initial parity (birth order -1).

3) Implications on Childhood Mortality

Son preference in Korea is estimated to result in substantial increase in parity progression and excess births of higher orders. In particular, son preference increases the probability of having a younger sibling in less than two years. In order to measure the impact of fertility differentials based on sex preference on childhood mortality, two additional multivariate analyses were done. First, we estimated the effect of a child's sex on the probability that a younger sibling

is born in two years. An estimation based on logistic regression shows that for children born during 1971-85 period, the probability of a child having a younger sibling born within two years is much smaller for a male child than a female chile, the odds ratio being 0.6902 (see table A8 for the complete list of estimated odds ratios). In terms of probabilities, 18.0 percent of male children and 24.1 percent of female children are followed by a younger sibling in less than two years. [1]

Next, we estimated the effect of a short succeeding interval on childhood mortality (probability of dying before age 5) through another logistic model, for those children born during 1971-85. The analysis shows that having the next sibling in 2 years has a large and statistically significant effect on a child's probability of dying before age 5, the odds ratio being 2.7 (table 6). Thus, the data from the Republic of Korea demonstrates that female children suffer excess mortality partly because they are more likely than male children to be followed by a younger sibling in two years. Numerically, female-male difference in the probability of having a younger sibling in two years (24.1-18.0=0.061) raises the odd of dying before age 5 by about 6 percent ((2.6564)0.061= 1.063).

Because families with no surviving sons are more likely to add more children than families with a surviving son, female children have larger average number of siblings than male children (see Park and Cho, 1995 for a comprehensive discussion). According to the logistic regression model of childhood mortality in Korea (table A9), the total number of siblings is not a statistically significant factor of childhood mortality. The situation is likely to be different in a country where the mortality level is high and the prevalence of poverty and childhood infectious disease is also high.

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1) These probabilities are computed from the over all probability of having next birth in two years (20.9%), proportion of male children (51.37%), and the odds ratio. Note that [18.0/(100-18.0)]/[21.1/(100-21.1)] = 0.69.

〈Table 6〉 Estimated effects (odds ratios) of covariates on mortality before age 5 among births in 1971~1985: Republic of Korea

	Odds ratio
Year of birth	0.9375*
Maternal age in years	0.9055*
Years of education	0.9256*
Residence (reference is rural)	
Metropolitan	0.5236*
Other urban	0.7267
Sex of child is male	1.3011
Birth order	1.5970
Younger sibling was born in 2 years	2.6564*
Total number of surviving children at birth	0.7656

Note: The odds ratios are estimated by logistic regression using STATA programs.

* indicates $p<0.05$.

Source: Individual records from 1991 National Survey of Fertility and Family Health.

5. Conclusion

The analysis of parity progression and child mortality in the Republic of Korea provides additional insight on the relationship between son preference and fertility, and childhood mortality in the context of fertility and mortality decline. The situation in the Republic of Korea demonstrates that fertility can decline to a very low level even in the presence of strong son preference, but continuing son preference has certain effects on fertility and childhood mortality. As fertility declined, women decided whether or not to have more children at increasingly earlier parities, and their decision depended at an increasingly higher degree on whether they had a surviving son or not. Thus, the effect of son preference on fertility increased as the level of fertility declined.

Our analysis also shows that when son preference is present, female

children are more likely to be born in an environment with a high mortality risk than male children. Female children were more likely to be followed by a younger sibling after a short interval and they had a larger total number of siblings than male children. Similar to our results in the previous section, short birth interval has been identified as one of the most important determinant of childhood mortality in most populations. Although in the Republic of Korea, the total number of siblings was not a significant factor of childhood mortality, it is likely to be an significant factor in other populations where general level of nutrition and sanitary conditions are poor and the prevalence of infectious disease is high.

Our findings confirm that son preference causes excess female childhood mortality both directly and indirectly through fertility. Parental discrimination of female children in feeding and health care causes excess female childhood mortality directly. In addition, female children suffer higher mortality than male children through pure demographic conditions resulting from mother's fertility behavior, which is affected by son preference..

The estimated excess mortality due to fertility differentials originating from son preference was not large in the Republic of Korea, although it was statistically significant. The Republic of Korea is a country with a combination of the strong son preference and low levels of fertility and mortality. In countries where son preference is weaker or fertility is higher, the effect of son preference on fertility is likely to be smaller. On the other hand, the level of childhood mortality is higher than in the Republic of Korea in most of the countries where the level of son preference is high. In these populations, the excess female mortality resulting from differential fertility caused by son preference may be large.

The findings from the Korea example illustrate the difficulties in eliminating excess female mortality in populations with high level of son preference. In Korea families have only small number of children on the average, economic and health care conditions are good, and mortality rate is low in general. It

is not likely that female children suffer excessive mortality because of inadequate nutrition or health care. Yet, female children suffer excessively high level of mortality and part of the excess mortality is due to parents' family building behavior related to the effort to secure the birth of a son.

APPENDIX

〈Table A1〉 Descriptive statistics of the covariates included in the multivariate analysis of progression to second births, by year of first birth in the Republic of Korea

	Year of first birth		
	Before 1975	1975-79	1980-84
Age at first birth	23.05	23.84	24.28
Years of education	7.99	9.54	10.53
Residence (reference is rural) (percentage)			
Metropolitan	49	51	49
Other urban	22	25	28
Rural	29	24	23
Childhood residence (reference is rural) (percentage)			
Metropolitan	13	22	24
Other urban	18	20	23
Rural	69	58	53
Have a surviving son (percentage)	53	54	53
Do not agree with "must have a son" (percentage)	41	56	63
Number of women included in the analysis	1,778	1,229	1,547

Source: Individual records from *1991 National Survey of Fertility and Family Health.*

〈Table A2〉 Descriptive statistics of the covariates included in the multivariate analysis of progression to third births, by year of second birth in the Republic of Korea

	Year of first birth		
	Before 1975	1975-79	1980-84
Age at second birth	24.48	25.77	25.96
Years of education	7.38	8.97	9.98
Residence (reference is rural) (percentage)			
Metropolitan	46	49	48
Other urban	21	24	28
Rural	33	27	24
Childhood residence (reference is rural) (percentage)			
Metropolitan	10	18	21
Other urban	16	17	23
Rural	74	65	56
Have a surviving son (percentage)	73	75	76
Do not agree with "must have a son" (percentage)	36	51	58
Number of women included in the analysis	1,417	1,151	1,326

Source: Individual records from *1991 National Survey of Fertility and Family Health.*

〈Table A3〉 Descriptive statistics of the covariates included in the multivariate analysis of progression to fourth births, by year of first birth in the Republic of Korea

	Year of first birth		
	Before 1975	1975-79	1980-84
Age at third birth	26.34	27.71	28.29
Years of education	6.60	7.83	8.78
Residence (reference is rural) (percentage)			
Metropolitan	37	42	40
Other urban	22	23	25
Rural	41	35	35
Childhood residence (reference is rural) (percentage)			
Metropolitan	7	8	16
Other urban	13	17	20
Rural	80	75	64
Have a surviving son (percentage)	85	83	82
Do not agree with "must have a son" (percentage)	27	39	47
Number of women included in the analysis	788	687	554

Source: Individual records from *1991 National Survey of Fertility and Family Health.*

〈Table A4〉 Estimated effects (relative risks) of covariates on progression to second births, by year of first birth in the Republic of Korea

	Year of first birth		
	Before 1975	1975-79	1980-81
Age at first birth	0.9837	0.9677*	0.9552*
Years of education	1.0098	1.0155	1.0139
Residence (reference is rural) (percentage)			
Metropolitan	1.0717	0.9817	0.8339*
Other urban	1.0668	0.9732	0.9111
Childhood residence (reference is rural) (percentage)			
Metropolitan	0.7746*	0.8856	0.8382*
Other urban	0.8402*	0.9732	0.9303
Have a surviving son (percentage)	0.8554*	0.8466*	0.8136*
Do not agree with "must have a son" (percentage)	0.8203*	0.7917*	0.7085*
Number of women included in the analysis	1,778	1,229	1,547

Source: Individual records from *1991 National Survey of Fertility and Family Health.*

* Indicates $p<0.05$.

〈Table A5〉 Estimated effects (relative risks) of covariates on progression to third births, by year of second birth in the Republic of Korea

	Year of first birth		
	Before 1975	1975-79	1980-84
Age at second birth	0.9655**	0.9470	1.0027
Years of education	0.9801*	0.9597*	0.9280*
Residence (reference is rural) (percentage)			
Metropolitan	0.7509*	0.7106*	0.6320*
Other urban	0.9296	0.8803	0.7316*
Childhood residence (reference is rural) (percentage)			
Metropolitan	0.7244*	0.7253*	0.6832*
Other urban	0.8929	0.8372	1.0367
Have a surviving son (percentage)	0.6036*	0.3418*	0.1675*
Do not agree with "must have a son" (percentage)	0.7731*	0.6572*	0.4964*
Number of women included in the analysis	1,417	1,151	1,326

Source: Individual records from *1991 National Survey of Fertility and Family Health.*

Note: The relative risks are estimated by proportional hazard models using BMDP programs.

* indicates $p<0.05$.

〈Table A6〉 Estimated effects (relative risks) of covariates on progression to fourth births, by year of third birth in the Republic of Korea

	Year of first birth		
	Before 1975	1975 79	1980 84
Age at third birth	0.9578*	0.9577	0.9315
Years of education	0.9895	0.9812	0.8874*
Residence (reference is rural) (percentage)			
Metropolitan	0.4246*	0.5718*	0.7152
Other urban	0.7811	0.7378	0.7903
Childhood residence (reference is rural) (percentage)			
Metropolitan	0.7860	0.8862	0.5078
Other urban	0.7944	0.9284	0.8563
Have a surviving son (percentage)	0.3600*	0.1949*	0.1016*
Do not agree with "must have a son" (percentage)	0.8121	0.5923*	0.5475*
Number of women included in the analysis	788	687	554

Source: Individual records from *1991 National Survey of Fertility and Family Health.*

Note: The relative risks are estimated by proportional hazard models using BMDP programs.

* indicates $p<0.05$

〈Table A7〉 Estimated proportions of women going on to have next child in 7 years, by birth order, year of birth, and whether or not a woman already has a surviving son or not in the Republic of Korea

Birth order	Year of birth	Have a son	Have no sons	
			Unadjusted	Adjusted
1	Before 1975	.9531	.9631	.9720
	1975~79	.9155	.9414	.9460
	1980~84	.7900	.8772	.8531
2	Before 1975	.7328	.9205	.8877
	1975~79	.4387	.8151	.8155
	1980~84	.1266	.5255	.5544
3	Before 1975	.4751	.8247	.8331
	1975~79	.2415	.7694	.7578
	1980~84	.0680	.4532	.4999

Note: The adjusted proportions are computed from the estimated hazard models in tables A4~A6 by setting the covariates other than "have a surviving son" at the mean values for women with a surviving son.

〈Table A8〉 Estimated effects (odds ratios) of covariates on the probability of a child having a next sibling in 2 years: Republic of Korea, births in 1971~1985

	Odds ratio
Year of birth	0.9343*
Maternal age in years	0.9944
Years of education	0.9981
Residence (reference is rural)	
Metropolitan	0.6815*
Other urban	0.7159*
Childhood residence (reference is rural)	
Metropolitan	0.8124*
Other urban	0.9207
Sex of child is male	0.6902*
Birth order	0.3436*

Source: Individual records from *1991 National Survey of Fertility and Family Health.*

Note: The odds ratios are estimated by logistic regression using STATA programs.

* indicates $p<0.05$.

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요약

출산력 전환기의 남아선호와 출산행태

김민자 · 김승권

한국에서는 가부장제도를 기초로 한 가족제도의 영향으로 심한 남아선호현상이 계속되고 있으며 또한 출산력은 최근 20여 년 간 급격히 저하되고 있다. 연구사례에 의하면, 한국은 남아선호경향이 세계 여러 나라 중 그 정도가 가장 심한 편이며, 출산력 저하속도 또한 어느 국가보다 빠르게 성취되었음을 보여준다. 이 논문에서는 잔존하고 있는 남아선호태도가 출산력 저하과정에서 출산행태를 통한 가족형성 과정과 영아 및 유아사망력에 어떤 영향을 끼치고 있는지 살펴본다.

한국을 비롯한 남아선호현상이 심한 나라에서는 출산행태가 남아선호 현상을 크게 반영하며 여아의 영아 및 유아 사망력이 남아보다 높다는 것은 이미 여러 연구결과가 입증해주고 있다. 이 논문에서 중점적으로 살펴보고자 하는 점은 남아선호, 출산행태, 영아 및 유아 사망력 세 분야가 급격한 출산력저하 과정에서 어떤 상호관계를 가지는지 살펴보는 것이다. 먼저, 동아시아와 남아시아의 남아선호 현상이 심한 나라의 기존 연구결과에 의해 남아선호 현상이 출산행태에 미치는 영향이 출산력 정도에 따라 어떻게 변하는가를 보고, 이어서 한국 조사자료(1991년 전국 출산력 및 가족보건실태조사)를 분석하여 출산력저하 과정에서의 남아선호 현상이 출산행태에 미치는 영향을 심층분석한다. 또 출산행태 자체가 영아 및 유아 사망력에 큰 영향을 준다는 점을 고려하여 남아선호 현상과 출산행태의 상호관계가 남 · 여아의 사망력 차이를 간접적으로 설명한다는 가정하에 그 차이정도를 검토한다.

동아시아와 남아시아의 출산행태에 의하면, 현존자녀 중 아들이 없는 경우는 아들이 있는 경우보다 추가자녀를 가질 확률이 훨씬 높으며, 그 확률의 비교차(relative risk)는 출산력 수준이 낮을수록 더 큰 경향이다. 다시 말하면, 출산력저하는 남아선호 현상과 출산행태의 상호관계를 더욱 악화시키는 결과를 보여준다. 합계출산율이 3.3이던 1974년 이전에는 아들이 없는 사람에 비해 아들이 있는 사람은 40% 적게 셋째 아이를 가졌으며, 합계출산율이 1.8이던 1980-84년에는 아들이 없

는 사람에 비해 있는 사람이 83% 적게 셋째아이를 가졌음이 추정되었다. 둘째-넷째 아이 중 "아들을 보기 위해서 원하는 아이보다 더 낳은 아이"는 1975년 이전에는 4% 정도였으나 1980-84년에는 13%나 되는 것으로 추정되었다.

남아선호 현상은 영아 및 유아 사망력에도 영향을 주고 있다. 한국의 영아사망력(0세)은 남자가 여자보다 조금 높지만, 유아 사망력(1-4세)은 여자가 남자보다 높은 것으로 추정되어 있다. 출산행태, 특히 출산간격은 영아 및 유아 사망력에 큰 영향을 준다는 점은 잘 알려진 사실이다. 한국에서도 자신의 출생 후 24개월 이내에 동생이 태어난 아이는 그렇지 아니한 아이에 비하여 5세 이하 사망력이 2.7배 이상 높게 추정된다. 또한 1971-85년 출생한 아이 중 남아선호와 출산행태간 관계의 결과로 여자아이는 24.1%가 24개월 이내에 동생이 태어난 데 비하여, 남자아이는 18.0%가 24개월 이내에 동생이 태어난 것으로 나타났다. 이러한 차이는 여자아이의 5세 이하 사망률이 남자아이보다 6% 높은 결과를 야기한다.

일반적으로 낮아진 영아 및 유아 사망력에도 불구하고 한국의 여자아이들이 남자보다 유아사망력을 경험하며 그 요인의 하나가 남아선호에서 비롯된 출산행태 때문이라는 것은 주목할 만한 점이다.

핵심어: 남아선호(son preference), 출산력(fertility), 영유아사망력(childhood mortality)