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Why is Son Preference Declining in South Korea?

The Role of Development and Public Policy, and the Implications for China and India

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Abstract

For years, South Korea presented the puzzling phenomenon of steeply rising sex ratios at birth despite rapid development, including in women's education and formal employment. This paper shows that son preference decreased in response to development, but its manifestation continued until the mid-1990s due to improved sex-selection technology. The paper analyzes unusually rich survey data, and finds that the impact of development worked largely through triggering normative changes across the whole society — rather than just through changes in individuals as their socio-economic circumstances changed. The findings show that nearly three-quarters of the decline in son preference

between 1991 and 2003 is attributable to normative change, and the rest to increases in the proportions of urban and educated people.

South Korea is now the first Asian country to reverse the trend in rising sex ratios at birth. The paper discusses the cultural underpinnings of son preference in pre-industrial Korea, and how these were unraveled by industrialization and urbanization, while being buttressed by public policies upholding the patriarchal family system. Finally, the authors hypothesize that child sex ratios in China and India will decline well before they reach South Korean levels of development, since they have vigorous programs to accelerate normative change to reduce son preference.

Why is son preference declining in South Korea?
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1.   Introduction

Across East Asia and much of South Asia, child sex ratios have become more masculine in recent decades (Figure 1) — despite the region's economic and social development, and many governments' policy efforts to induce parents to value daughters more equally with sons.[1] Indeed, the only public policy that has demonstrably helped normalize national child sex ratios is in Mao's China and North Korea — where an ideology of gender equality backed up by collectivization and control over private lives sharply reduced the scope for households to prioritize resource allocation among their members.[2] More desirable ways of reducing son preference are needed.

Until a few years ago, South Korea appeared to epitomize the pattern of rising sex ratios despite rapid development — with dramatic increases in levels of education, industrialization, and urbanization, as well as in women's education and participation in the formal labor force (Table 1). By the mid-1990s, South Korea was officially included as a member of the developed countries' club, the OECD.   Yet sex ratios at birth rose steeply during this period (Figure 2). The sex ratio of the total population has not risen correspondingly, since female life expectancy at birth has risen more rapidly than male.[3]

This flew in the face of over a century of social science theory.   Early theorists focused on the profound cultural and behavioral implications of the shift from pre-industrial to industrial economic organization.[4]   Essentially, this involved a shift from face-to-face communities bound by religious and other traditions, to more impersonal social groupings characterized by contractual associations. Accompanying this was a shift whereby people's social status derived less from "ascription" based on characteristics such as their family of birth, and more from their individual achievements.   Later theorists argued that "modern" societies and individuals are motivated by the pursuit of innovation and rationality, rather than adherence to traditions.[5]   The Korean experience also challenged the idea that increases in women's education and labor force participation reduces gender inequalities in intra-household allocation of resources.

Since the mid-1990s, however, sex ratios at birth in South Korea have shown a steady decline, setting a new trend in Asia.   This raises some important questions, which we explore in this paper.   Firstly, what light does the South Korean experience shed on the complex issue of the relationship between "development" — a shorthand for the economic and socio-psychological changes summarized above — and son preference?   Secondly, what light does the South Korean case shed on likely trends in other countries such as China and India, and what policies might help reduce son preference there?   Or will they have to wait until they are as highly developed as South Korea before child sex ratios begin to normalize?

To understand the relationship between development and son preference, it is important to clarify some points. Firstly, sociological theory indicates that economic development brings about normative and behavioral changes primarily at a *societal* rather than merely an *individual* level. Analysts of the diffusion of innovations have pointed out that new ideas are first adopted by those who are most exposed to new information, and then spread in a snowballing fashion through a population.[6] Yet most analyses of son preference have focused heavily on correlating *individuals'* characteristics with measures of their son preference, and therefore fail to capture the more important effects of underlying secular trends in a population. This may help explain why the literature shows mixed evidence that development mitigates son preference in Asia (Croll 2000).

A second point that needs clarification is the distinction between the *intensity* of son preference felt by people, and its actual *manifestation* on the ground in sex ratios — which is what most

studies focus on.[7]   These two phenomena can sometimes move in opposite directions, as in South Korea during 1985-1995 (Table 2, Figures 2 and 3). This can happen when social norms regarding son preference are weakening, while new technologies become available which make it easier to manipulate the sex ratio at birth. The same applies if better technologies become available for assuring children's survival after birth, since they can be used more assiduously for boys than for girls. Moreover, since educated women are typically better able to access and implement these new technologies, studies can even appear to suggest that gender outcomes for children are worsened by development, and even by improvements in the position of women.[8]

In this paper, we use these two distinctions to inform our analysis of the relationship between development and son preference in South Korea.   Our analysis is made possible by the fact that South Korean fertility surveys actually ask women about their underlying son preference.   The usual practice in fertility surveys is to ask respondents about their preferred number and sex composition of children. The Korean surveys ask a very different question: they ask respondents whether they feel it is imperative to bear a son. This provides a measure of the underlying intensity of son preference. We analyze not only the individual-level characteristics correlated with this variable, but also the secular trends in this variable.

We begin by describing the cultural underpinnings of son preference in South Korea: how these arose from centuries of social engineering designed to make Korea a strong authoritarian state, and how they have been re-shaped by development and by public policies since the 1950s. This is followed by an analysis of the National Fertility and Family Health Surveys conducted in 1991 and 2003 in South Korea.   Throughout our analysis, we use the term "son preference" to refer to the underlying son preference, and not its manifestation.

Briefly, our analysis indicates that development has altered son preference primarily through setting in motion changes at the societal — rather than the individual — level. Son preference is as expected inversely related to individual socio-economic status, but our decomposition analysis shows that the overwhelming factor underlying the reduction in son preference is a secular trend of changing social norms cutting across all socio-economic groups. We argue that son preference declined in South Korea primarily as a result of ideational change triggered by changes in underlying social and economic conditions, analogous to the discussion in the demographic literature of the role of ideational change in altering fertility behavior.[9] Interestingly, this has happened despite strenuous efforts by the government until recently, to maintain traditional family and gender relations, through legislation and other policies.

2.   **Factors underlying son preference and forces of change**

The roots of son preference in Korea

The patriarchal family system that underlies son preference in Korea was introduced through a process of rigorous social engineering during the early-mid Choson dynasty (1392-1910).   It replaced a much more bilateral family system, in which a couple might live with either the woman's or the man's family, and male and female offspring could both inherit their parent's property (Deuchler 1992:80-81).

Deuchler (1992, 2003) gives a detailed description of this transformation of the dominant kinship system in Korea.   It was central to a Confucian strategy of building a strong authoritarian state,

borrowing heavily from readings of Chinese texts. The Confucians set out to obliterate Buddhism, with its emphasis of individual self-realization and salvation, which they felt detracted from loyalty to the family and state. They sought to replace this with a tightly structured system of kinship and political relations designed to promote stability and loyalty to a series of nested corporate groups — the household, the lineage, the state — underpinned by prescribed rituals.

The core of this system was a rigidly patrilineal kinship system, which specified in extensive detail the roles and status of each member of a household and lineage, under the unchallenged authority of the (male) head of the family. These authoritarian kinship relationships were mirrored through the political hierarchy, culminating in obeisance to the king.

> "Neo-Confucianism not only masculinized the public sphere…, but also established the family as the proto-typical metaphor of social relations among individuals and groups" (Moon 2002: 478).

> "Social organization was tied together by a threefold mechanism: the domestic sphere, represented by the wife, was subordinated to the public sphere, represented by the father and son, they in turn were the sovereign's subjects"." (Deuchler 1992:111).

Ancestor worship was strenuously promoted, as a means of strengthening corporate bonds within the family and lineage (Deuchler 1992:133). This ensured that people were engaged not merely in assuring the welfare of their current family members, but that they sought to assure the well-being of previous generations of ancestors through specified ritual practices, as well as by bearing sons to ensure that the corporate group would endure over generations. Over several centuries, the neo-Confucians and the Department of Rites refined the details of this patriarchal authoritarian regime, and fought relentlessly against the survival of traces of the old bilateral system of kinship.

Strong supernatural sanctions ensured conformity to the Confucian rules. Kendall (1984) describes beliefs in ancestors and ghosts in rural Korea in the 1980s, and spells out how they served to generate a great deal of pressure to conform to the needs of the corporate group.[10] Ancestors who bore sons, and are cared for by their agnatic (male-line) descendants can be a benign influence on their family. But even these can be restless and dangerous if they died with unfulfilled desires, such as seeing their grandsons. Those who died unmarried or without male descendants are filled with resentment and can create all kinds of problems for their siblings and other kin. It is apparent that there is much pressure from a wide range of family members to ensure that each individual performs their filial duties of marrying and bearing sons quickly, and caring for their ancestors.

This was a highly ascriptive system. Access to political power, as well as the economic and social assets of the lineage, was regulated through one's position in the lineage. Appointments to government office depended on passing examinations, but candidates were only eligible to sit the examinations if they had the right position in a noble *yangban* lineage.[11] State sanctions reinforced lineage rules: for example, the sons and grandsons of widows who defied the ban on widow re-marriage were not allowed to take the civil service examinations.

Lineages formed part of larger superordinate lineages of increasing size and generational depth, which are sometimes referred to as "clans" in Korea.[12] Many villages had a dominant lineage, to which the majority of men belonged. It was common for lineages to hold some joint property, which was used to support ancestor worship rituals, and to help lineage members in need. Lineage members interacted frequently in the context of daily life and specified rituals, and offered a source of mutual support and mutual supervision: "the *p'a* (lineage) performed many of

the social services on the local level that are now provided by public schools, police, and social welfare agencies" (US 1990, parentheses ours).

Lineage membership thus determined much of a person's life chances. Genealogies were carefully maintained, showing the exact nature of each (male) member's relationship with the lineage. The lineage was continued through the line of the eldest son in each generation, and other sons in each generation would start their own sub-lineages. This meant that the eldest son had the burden of caring for all the male ancestors, and it was especially important for him to bear a son to continue the family line (male descent line).

Women were severely marginalized by these strict rules of patrilineal kinship and inheritance which placed the father-son duo in the public sphere and relegated women to the domestic sphere. Strict rules of lineage exogamy meant that wives would be outsiders in their husband's village: as a result, women were socially isolated whereas men were surrounded by networks of social support. At marriage, a woman and her unborn children would be formally transferred to her husband's family: so only sons could care for their parents in this life and in their afterlives. A woman's primary duty was to bear sons to ensure the continuity of her husband's lineage.

State policies reinforcing patriarchy, since the 1950s

Between the 1950s and the establishment of democracy in 1987, the Korean state sought to reinforce Confucian traditions in order to maintain social and political stability under a series of authoritarian governments. The rules of patrilineal social organization were formally legalized into the Korean Civil Code in 1958, in provisions also referred to as the Family Law. *Inter alia*, these stipulated that family headship must be held by the men in the line of the eldest son, that inheritance should be through the male line, that men must marry outside their lineage, that women should be transferred to their husband's family register upon marriage, and that the children belong to the father's lineage even in the case of divorce.

From the 1960s onwards, successive governments in Korea used their authoritarian powers to effect rapid economic development through a series of highly directed initiatives. Promoting the traditional principles of loyalty to the ruler and filial piety, they freed themselves to a large extent from the need to cater to competing constituencies. There was active repression of citizen demands for democracy, and of trade union activity not approved by the military regimes, and calls for greater gender equity were largely ignored (Moon 2002).

This suppression of competing constituencies made it possible to channel national resources towards rapid industrialization. Wages were kept low, to permit high levels of investment in industrial growth, and to keep Korean exports competitively priced. For similar reasons, state expenditures on social welfare were curtailed. As late as 1989, when the country was just a few years away from becoming a member of the OECD, the government emphasized that families would continue to be primarily responsible for social welfare (Moon 2002:483). The state encourages people to support their parents through a variety of measures, including tax breaks, housing loans, filial piety awards, and the annual observance of an "Old Age Day" (Prendergast 2005). This means, of course, that women would continue to bear the burden of caring for the young, the old, the sick, and the disabled.

To use women most effectively for national development, women were hired in the labor force but expected to leave work when they married, and return to part-time work once their households needed them less. They have contributed heavily to the labor force in low-paid jobs in factories and offices. More recently, there has been a trend of greater employment of women

in professional positions, and towards women remaining in the labor market after marriage.[13]

Women's organizations were established by the state as part of national development drives. For example, the New Village Women's Association and Mothers' Clubs were established to implement state policies of population control and economic development, as well as inculcating political loyalty.[14] There were some spontaneous women's movements, which pressed for greater gender equity, and especially for reforms of the Family Law. However, these had limited success until after the establishment of democracy in 1987. In 1990 the Family Law underwent some major reforms, but as noted above the government was at that time still highly committed to maintaining traditional family roles.[15] Therefore the system of male family headship was retained, leaving women relegated to secondary position.

However, citizens came increasingly to question the relevance of these traditions for organizing their present-day lives. The women's movement gained momentum along with the success of civil society movements demanding an end to military rule, and was successful in obtaining court judgments challenging the constitutional validity of key aspects of the Family Law.[16] Individual petitioners were also successful: for example, in 1997 the Constitutional Court of Korea ruled it unconstitutional to prohibit marriage within the lineage. In 2005, the Supreme Court ruled that women could remain members of their natal household after marriage, and that women and men have equal rights and responsibilities to care for their ancestors (Kim 2005). Eventually in 2005, the government abolished male family headship and allow parents who so wished to register their children under the mother's family name with effect from 2008.

Forces of change: the role of industrialization and urbanization

Industrialization and urbanization break the stranglehold of the lineage and family on the individual through many channels. As described above, in pre-industrial Korea a person's access to power, social status, and economic opportunities depended heavily on their gender, lineage, and even their position within that lineage. With the advent of industrialization, increasing proportions of the population became able to earn a living independent of their position in the family, through jobs which they could acquire purely on the basis of their personal skills and qualifications. Increasing proportions of people also obtained formal education, which further reduced their dependence on the family and also exposed them to new ways of thinking.

Another factor is that growing proportions of the population have retirement savings for their old age.[17] As a result, people have become less dependent on financial support from their children. However, this does not reduce the need for sons to support them in their afterlife, as no earthly savings can take care of this need.

The organization of urban life also differs enormously from that of rural life, reducing the centrality of sons in their parents' lives. To begin with, the lineage is much less omnipresent in urban life. While villagers spend their daily lives surrounded by members of their lineage and community, urban residents live and work in the more diverse and impersonal settings of apartment blocks and office complexes. This reduces pressures to conform to traditional expectations of filial duty. Access to social support networks also changes: in rural areas women are isolated while men are surrounded by kin, but this does not hold in urban areas. In fact, churches and temples form a core part of urban social networks in South Korea today, and women are the main players in this.[18]

The greater physical mobility associated with non-agrarian life means that sons may no longer be near their parents to help care for them. And married daughters may live near their parents,

unlike rural areas where lineage exogamy is typically synonymous with village exogamy. Whether urban parents derive support from a child comes to depend less on formal rules based on the gender and birth order of the child, and more on who lives in the same city and the strength of the parent-child relationship. This reduces the gap between the value of daughters and sons to their parents.[19]   And female education and employment further enhances the potential value of daughters, especially when they are not completely cut off from their parents as in rural areas.

The conditions of urban life also make it easier for parents to implement greater gender equity in inheritance.   Customary rules of inheritance are the most inflexible regarding immovable lineage assets such as land: giving these to a daughter would involve the deeply radical action of passing land out of the lineage.   Efforts in China and India to encourage equal inheritance of land met with violent resistance.[20]   It is far easier to give daughters a share of savings and assets acquired on one's own in non-farm occupations.   It is also far easier for women to demand their rightful inheritance in urban areas, where legal resources are close at hand — in contrast to rural areas, where such amenities are distant and instead the woman is surrounded by entire male lineages hostile to her intent.

Decades of cumulative social change associated with the above trends seem to have relaxed the pressure to bear sons.   As discussed below, the felt need to have sons has declined sharply across all age-groups and socio-economic groups in the population. These changes are illustrated by one woman's story of her own family, recounted in 1996 before it was apparent that the trend of sex ratios at birth was reversing:[21]

> "My eldest brother took a concubine and had a son with her because his own wife had not borne a son. My husband's parents disinherited their eldest son because he did not have a son, and gave their property to the second son: he never forgave his wife for not having a son.   But my husband's youngest sister was supported by her husband although she had only daughters, even though his parents were terribly angry since they had adopted him in order to carry on their family.   A few young couples now are able to bear the pressure of not having a son."

Interestingly, the national survey questionnaires also reflect these changes in social norms.   In 1991, women were asked how many brothers their husband had, and his birth order amongst his brothers. But in 2003, they were asked how many brothers *and sisters* their husband had, and his birth order amongst them.   The social science literature on South Korea includes much discussion of the shift in women's position.[22]

3.   Data and Methods

We analyze the data collected in the Korea National Fertility and Family Health Surveys of 1991 and 2003, which were conducted by the Korea Ministry of Health and Welfare in cooperation with the Korea Institute for Health and Social Affairs. These are nationally representative sample surveys, using the preceding census for their sampling frame. The 1991 survey is the oldest nationally representative fertility survey in South Korea for which the raw data are still available, and the 2003 survey is the most recent one conducted. The sampling method and contents of the survey are described in detail in Korea Institute for Health and Social Affairs, (1992, 2004).

In both surveys, all women in the sample who were aged 15-49 and ever-married at the time of the survey were interviewed, and a range of data collected on their fertility history, attitudes to family-building, and background characteristics of the woman and her husband.   The sample size

was around 7,000 and 6,500 women in 1991 and 2003, respectively.

Variables

Our dependent variable is whether or not the woman stated that it was imperative to have a son ("must have a son").   As Table 3 shows, this variable is clearly related to women's actual childbearing decisions: those who reported strong son preference were far more likely than the others to manipulate their sex ratios at birth if they had not yet borne a son.

Our independent variables include a range of socio-economic characteristics of the woman and her husband.   These have been shown in previous studies to be related to fertility attitudes and behaviors, and therefore we hypothesize that they are similarly related to the strength of son preference.   The educational level of the woman and her husband is hypothesized to be inversely related to son preference, as is their employment status, especially in white-collar jobs which imply a higher social status.   Rural residence is hypothesized to be associated with greater pressure to conform to traditional views on the need to bear sons, and residence in a metropolis to be associated with weaker son preference than residence in a small city.   In addition, the 1991 survey asked about where respondents and their husbands had lived for the longest period before marriage, and we hypothesize that this will be similarly related to son preference as current residence.   We also hypothesize that since traditional attitudes have been weakening over time, a woman's age will be inversely related to her son preference.

Additionally, we hypothesize that there is a secular trend in the intensity of son preference between 1991 and 2003 which cannot be explained by the other independent variables in our model. To test this hypothesis, we include for a pooled sample of the 1991 and 2003 surveys, a dummy for the year of survey (with a value of 1 if the respondent was interviewed in 2003 and 0 if it was in 1991).

A number of variables capture the extent to which women and their husbands are subject to familial pressure, which might be expected to be associated with stronger son preference.   The extent of parental pressure to have sons is captured by whether the husband is the only son.   As described above, the filial duty to have a son is especially strong if the husband is the only son, and therefore the only person who can assure the continuity of the lineage.   Ideally, we would have analyzed this effect for the eldest son, who is traditionally the one designated to continue the lineage, but this information is not available in the 2003 survey.   Similarly, if the couple lives in a joint family — typically with the husband's parents, though this is not specified — we would expect the woman to be subject to greater pressure to have a son.

Women who indicate lower conformity to tradition in their marriage decisions by marrying at an older age are hypothesized to have lower son preference.   In addition, the 1991 survey collected information on whether the parents decided the marriage, and we hypothesize that this will be associated with stronger son preference.

The 1991 survey also asked the woman's and her husband's religion. We hypothesize that those who report that they are "Buddhists" will have higher son preference than others, as has been found elsewhere.[23]   Very few people report their religion as Confucian, since Confucianism is viewed more as a part of the culture, not a religion as such, but Confucian values are pervasive across the population regardless of religious affiliation.[24] They are strongest amongst those who report themselves to be "Buddhist" — who are concentrated most in the Eastern region, which also manifests the most conservative Confucian values.[25]   After centuries of suppression of traditional Buddhist tenets, the term "Buddhist" has come to be largely synonymous with stronger

adherence to Confucian family traditions and Korean folk religions[26] — as compared with Christians, whose religion has some strong roots outside of Korean traditions.

Methods

Our analysis has four steps. First, we examined the relationship between women's characteristics and their reported son preference in 1991 and 2003, using frequencies and chi-square tests (results not shown).   Second, we used multivariate logistic regression analyses to estimate the odds ratio for the association between a respondent's characteristics and having strong son preference, while adjusting for all the other characteristics in the model. This was done separately for 1991 and 2003 using the same variables for easy comparison, and a third regression was run including the variables available only for 1991, as well as a fourth regression used the pooled data from both the 1991 and 2003 surveys (Table 4).   Third, we examined changes between the two survey years in the probability of reporting intense son preference, within a given subgroup of women.   This was done by merging the 1991 and 2003 datasets, and conducting univariate logistic regression analyses for each selected characteristic of women (Table 5).

Fourth, we decomposed the contribution of two factors to the decline in the intensity of son preference between 1991 and 2003: changes in population composition and changes in social norms (Table 6).   The first is the contribution attributable to increases in education and urbanization ("population composition").   This we estimate by holding the levels of son preference constant at those reported by specific education and urbanization categories of women in 1991, and increasing the proportions educated and living in urban areas from their 1991 levels to their 2003 levels.   The second is the contribution of changes in social norms. This we estimate by holding the population composition constant at their 2003 levels, and changing the level of son preference of each socio-economic category of women from their 1991 levels to their 2003 levels. We also estimated the independent contribution of each of the variables in the model. The decomposition methodology used is described in the Appendix.

To assess the robustness of our estimates of the contribution of each independent covariate, we also did the decomposition without the constant term (results not shown).[27] A rationale for this is to make the estimates for the independent contribution of each of the variables in the model more directly comparable, since the constant term refers to an underlying shift and is therefore applicable only to the part associated with changes in ideas of son preference.

4.   **Trends in son preference**

Trends in the manifestation of son preference:

Figure 2 shows the trends in the sex ratio at birth, and the trend in the Total Fertility Rate. Fertility levels declined rapidly between 1970 and 1985. The sex ratio at birth was high during the 1970s, even before the advent of sex-selective technology. This may reflect female infanticide at birth, and not reporting the child as a live birth. Sex-selective technology became widely available by the mid-1980s, and the sex ratio at birth rose sharply until the mid-1990s (Figure 2). Since then it has been declining, but is still well above normal and South Korea remains second only to China in the masculinity of its sex ratio at birth.

It is striking that the sex ratio at birth fell while the Total Fertility Rate plummeted to just above 1 child per woman. Rapid reduction in fertility tends to increase pressure not to have girls — as the

total number of children that people want falls, leaving less space for tolerating daughters. There is some evidence of this in the disaggregated data: for example, sex ratios at birth rise sharply with parity in Table 3, especially amongst women who have not borne a son.[28]

Figure 2 shows another interesting feature. There are sharp annual fluctuations in the sex ratio at birth which is related to the cycle of animal years: fewer girls were born in the animal years deemed to be associated with personality characteristics which would not make for good wives.[29] These annual fluctuations are much smaller after the mid-1990s, suggesting that as people abandoned their traditional beliefs about the place of men in the universe, they also abandoned their beliefs about personality characteristics associated with animal years.

Trends in underlying son preference:

Women's reported underlying son preference has been declining sharply over time. Table 2 shows a steady decline between birth cohorts in the percentage reporting that they "must have a son". Two-thirds of the oldest women interviewed in 1991 stated that they "must have a son", and this fell to below 30 percent amongst the youngest women interviewed in 1991.

Figure 3 shows the proportion of women in successive surveys who reported that they "must have a son" fell slowly between 1985 and 1991, and then precipitately. Clearly the decline in underlying son preference was snowballing through the population. As mentioned above, this reported intensity of son preference is clearly associated with actual family-building behavior (Table 3).

The most striking evidence of a secular decline in son preference is the fact that women with similar individual characteristics showed lower son preference in 2003 than in 1991 (Table 5). Comparing the responses obtained from women of the same birth cohort in 1991 and 2003 shows that, in each birth cohort, there was an approximate halving of the proportions reporting strong son preference over this 12-year period (Table 2). For example, 35 percent of women born in 1955-64 said that they "must have a son" when interviewed in 1991, but only 19 percent of them were still of this view in 2003. This secular trend in son preference is analogous to that shown in responses about family size preferences in India, where it is not uncommon for older women to say "In my day we reproduced like animals, but things have changed and I have told my daughter-in-law to get sterilized after two children".

5.   Correlates of son preference: Odds of stating "must have a son"

Summary statistics: univariate analysis

The univariate analysis of the socio-economic characteristics that we hypothesize to be associated with son preference show associations in the expected directions (results not shown). This includes the woman's and her husband's education, occupation, urban/rural residence, and religion; whether the husband is the only son of his parents; whether the couple live with their parents; whether the parents decided the marriage; and the woman's birth cohort and age at marriage. All these variables show significant differences in the expected directions, in both the 1991 and 2003 surveys — son preference declines with increasing socio-economic status, lower parental control, younger birth cohort, and older age at marriage. "Buddhists" show significantly higher son preference, as do women whose husbands are the only son, couples who live with their parents, and those whose marriages were decided by their parents. And where

both variables are available for both survey years, there is a significant decline during 1991-2003 in the son preference associated with each variable.

Multivariate analysis

The results of the multivariate logistic regressions are shown in Table 4.   These show the odds ratios of women stating strong son preference, relative to the base category within each variable. We ran models with the same variables for the 1991 and 2003 surveys, to facilitate comparison of the results from the two surveys (Table 4, cols 1 and 2). We also ran a model using the pooled sample of women in both surveys, to test whether there is a secular trend in son preference between 1991 and 2003, independent of the other variables in our model (Table 4, col 3).

In addition to this, we ran a separate regression for the 1991 survey which added variables that were unavailable in the 2003 survey (results not shown). The addition of these variables changes little in the results, except for muting the effect of women's education.   Here we report the results of this model only for these additional variables.

Education and occupation: The data indicate that higher levels of women's education are associated with lower son preference, and that the odds of strong son preference decline more sharply with increasing education in the 2003 survey than in the 1991 survey.   The association is much weaker for husband's education in 1991, and not significant in 2003.   Women with white collar jobs showed significantly lower odds of strong son preference in 1991, but not in 2003. Husband's occupation does not show a significant association.

Rural / urban residence: Living in urban areas is significantly associated with lower son preference, and the effect is even sharper for metropolises than for small cities.   This is true for both 1991 and 2003, but the differences are sharper in 1991 --- implying that differentials by residence became less sharp by 2003.   Information on previous residence is available only for 1991, and shows significant negative association only for women's previous residence, not that of their husbands.

Religion: Being "Buddhist" is strongly associated with higher son preference in the case of women.   As discussed above, traditional Buddhism was effectively suppressed in Korea, and people who report themselves to be "Buddhist" today are amongst the most conservative adherents of Confucian values.   The association is not significant in the case of their husbands. Unfortunately, these data are not available for 2003.

Parental pressure: If the husband is his parents' only son — and therefore the only source of a continued line of male descendants — there is a significantly higher likelihood of the woman reporting that she "must have a son." Interestingly, this association intensifies between the 1991 and 2003 surveys.   Living with parents shows a significant positive association with son preference only in the 1991 survey.   Although our data do not throw light on why this shift has taken place, one possible reason may be related to the popular perception that the children now seek to live with their parents in order to obtain help with childcare, rather than the traditional expectation of supporting aging parents.[30]

Women's autonomy in marriage: In 1991, older age at marriage was associated with lower son preference.   This relationship is almost non-existent in 2003.   The data (available from only the 1991 survey) on whether the parents decided on the marriage indicate that women with arranged marriages were more likely to show traditional values of son preference.

Woman's birth cohort: The younger the woman, the lower the son preference in both 1991 and 2003.   This confirms the trend found in reported son preference in Table 2, and shows that the trend remains significant even after controlling for many socio-economic, and cultural factors associated with son preference.

Secular trend 1991-2003:   From the model with the pooled sample of women in the 1991 and 2003 surveys, we found a strikingly large and significant secular trend between 1991 and 2003. Controlling for all the above independent variables, the odds ratio of stating "must have a son" was only 0.34 in 2003 as compared with 1991.

6.   Why is son preference declining? A decomposition analysis

We now turn to analyzing the relationship between Korea's socio-economic development (as measured by education and urbanization), and the decline in reported son preference between 1991 and 2003.   To do this, we decompose the respective contributions of (a) changes between 1991 and 2003 in "population composition", i.e. the proportions of the population who are educated or living in urban areas — holding each group's intensity of son preference constant at 1991 levels; and (b) change in "social norms" between 1991 and 2003, i.e. lower level of son preference within a given education or urban/rural residence group — holding the population composition constant at their 2003 levels.

There have been rapid changes in "population composition", as well as in "social norms" during this period. Table 1 shows the dramatic increases in levels of education and urbanization in South Korea.   Table 5 shows the sharp decline between 1991 and 2003 in the odds ratio of stating "must have a son": in 2003, it is roughly one-third of its 1991 level within any given category of education and urban/rural residence.   The exception to this is in rural areas, where the odds ratio dropped to less than one-fifth its 1991 level.   This is especially notable because it implies rapid diffusion of new norms to rural areas, and consequent homogenization between rural and urban areas.

The results of the decomposition are shown in Table 6, and show the contribution of each variable to the overall decline in the probability of stating "must have a son" over the period 1991-2003, *other things equal*.   The most striking result is that change in social norms accounts for as much as 73 percent of this decline, and only 27 percent of the decline is accounted for by changes in population composition (increases in education and urbanization).   This is consistent with the findings in Table 2, which shows that son preference declined with birth cohort, and also that women of the same birth cohorts were far less likely to report strong son preference in 2003 compared with 1991.   It is also consistent with Table 5, which shows similar declines in son preference across all education and urban/rural groups — except among rural residents, who actually showed a steeper decline in son preference than urban residents.

That there was widespread change in social norms across the entire population between 1991 and 2003 is indicated by the fact that the estimate of the constant term is significant, positive and very large.   The inclusion of the constant term renders the association between son preference and education insignificant, and urban residence becomes associated with increased son preference (see also Table 5).   When the constant term is eliminated (results not shown), husband's education and urban residence become significantly associated with lower son preference. However, the overall results are fairly similar across the two models: changes in social norms account for 73% of the total change with constant term, and 81% without it.

Turning to the contribution of changes in "population composition" to the decline in son preference between 1991 and 2003, we find that increases in women's education contributed as much as 19 percent of the total decline, particularly the increases in the proportions of women in the highest education group. Changes in husbands' education levels have a more mixed and muted effect. Another 11 percent of the decline is contributed by increases in the proportion living in small cities.   Increases in the proportion living in metropolitan cities have the opposite effect, possibly because those with high levels of education are concentrated in large cities and so the education variable captures the effect of residence in large cities.[31]

7.   Discussion

South Korea is a trendsetter in Asia in terms of development, and now also in reversing the trend of rising child sex ratios (Figure 1). We have sought to analyze this case to understand how son preference is affected by development, and to throw light on the prospects for achieving more equitable child sex ratios elsewhere in Asia.

We discussed the cultural roots of son preference, and how they are affected by development. In Korea, Confucian administrators constructed an authoritarian society based on a rigid system of corporate patrilineages subservient to the king. Corporate loyalty was underpinned by ancestor worship rituals, with the threat of supernatural sanctions if people did not carry out their filial duties — of which the primary one was to bear sons to assure the continuity of the corporate group. Lineage membership passed strictly through the male line, and determined much of an individual's access to economic opportunities and social status. Women were thoroughly marginalized in this system.

This pre-industrial social organization disintegrated in the face of industrialization and urbanization. Avenues opened up for obtaining livelihoods and social status which were independent of lineage membership and adherence to familial expectations. The accompanying urbanization resulted in people no longer being surrounded by patrilineal kin in their place of residence and work. This also opened up a possibility for relationships between parents and their children to be driven by affect rather than by rigid rules of gender and birth order. All these changes helped undercut the bases for son preference.

Since Korean surveys ask about underlying son preference, we were able to analyze the factors associated with its reduction. The trend in underlying son preference was unidirectional in a way consistent with modernization — uncomplicated by the sharp changes in actual sex ratios at birth caused by animal years or improved access to sex-selective technology.

Our findings highlight the importance of societal as opposed to individual change in the decline of son preference. A simple comparison of the responses given by women of the same birth cohort when interviewed in 1991 and 2003 shows that the proportion reporting strong son preference in each cohort halved over this period. The multivariate analysis shows that the odds of a woman stating "must have a son" in 2003 were only a third of their 1991 levels, after controlling for a wide range of socio-economic characteristics. A similar decline is evident within each socio-economic group. Our decomposition analysis indicates that nearly three-quarters of the decline in son preference between 1991 and 2003 is attributable to a secular trend of changes in social norms sweeping across the population, and only a quarter is attributable to increases in the numbers of people proportions educated and living in urban areas.

This suggests that the impact of development worked largely through triggering normative change within the society as a whole, rather than just through changes wrought in individuals as their socio-economic circumstances changed. This applies not only to overall increases in education and urbanization, but also to increases in female education and employment — to the extent that these increased women's economic value, their contribution was largely via their impact on social norms, rather than at an individual level. Our results are similar to Lesthaeghe's (1983) conclusions relating fertility trends in Europe to ideational change brought about by changing economic conditions and the growth of secular individualism.

The decline in the intensity of son preference began amongst the educated professional urban elites, and spread quickly across the rest of the population. This follows the pattern put forward in studies of the collective adoption of new ideas: a slow start, initiated by those with the greater exposure to new information, and then a snowballing of adoption through the population.[32] Now the most conservative groups, such as rural residents, show the maximum fall in son preference.   Interestingly, the demise of traditional beliefs is also reflected in the fact that the sex ratio at birth shows less manipulation in response to the animal year: parents are less concerned to avoid bearing daughters in inauspicious years.

Another interesting point that emerges from the Korean case is that these social changes occurred *despite* state policies seeking to bolster the traditional family systems.   Successive authoritarian regimes sought through their laws and public policies to sustain Confucian traditions, as they offered a way of maintaining political stability and pursuing a developmental agenda which subsumed individual interests to those of the nation.   These efforts slowed down the process of change, but civil society came increasingly to question the old traditions and to pressure the government to change its policies. Civil society was successful in pressuring the authoritarian military regimes to give way to democracy, whose gradual establishment was marked by mileposts such as the democratic constitution of 1987 and the election in 1993 of the first civilian president since 1963   — and to other socio-political agendas such as changing the laws upholding the marginalization of women.   The demolition of these laws was completed only in 2005.   As the Supreme Court said in its landmark ruling on the Family Law:

> "Recognizing only male adults as members of a family clan (lineage) and excluding female adults from it has little logic in today's society…." (Supreme Court of Korea 2005, cited in Kim 2005, parentheses ours).

The process is far from complete. The sex ratio at birth in South Korea is still very high. There is continuing strength in beliefs that one must fulfill one's filial duty to continue the (male) family line. Even in 2003, women continue to report significantly higher son preference — controlling for a range of other characteristics — if their husband was the only son of his parents, and therefore the only source of male descendants. Reduction in the *manifestation* of son preference has also been slowed down by fertility decline, as evidenced by the increasing efforts of women to manipulate the sex ratio of their second and higher births if they have not already borne a son.

The South Korean case throws interesting light on the role of public policy in reducing gender inequalities. On the one hand, its policies of rapid economic development induced a breakdown of pre-industrial social structures, and also raised levels of female education and participation in the formal labor force. On the other hand, successive authoritarian military regimes maintained laws and policies that kept women marginalized in their domestic and public lives, and these were amended only recently as the political environment changed. It is possible that without these state efforts, the sex ratio at birth would by now be normal, instead of merely at the elevated levels prevailing before the advent of sex-selection technology.

What light does the South Korean case shed on the likely trajectory of child sex ratios in China and India, which continue today to soar? The cultural roots of son preference lie in similar kinship systems in South Korea, China, and in the parts of northwestern India where child sex ratios are very high (Figure 1).[33] In many ways, South Korea is much better placed than China and India for a reduction in child sex ratios. It is far ahead of these countries in terms of industrialization and urbanization. It also has the advantage of being a small and homogenous country, where ideas can diffuse rapidly through the population — in contrast with large and complex countries such as China and India.

Yet there is reason to believe that child sex ratios in China and India may begin to normalize before these countries become as highly developed as South Korea. Firstly, there are rapid changes even in the rural areas of these countries, which are conducive to reduced son preference. The spread of non-farm employment diversifies sources of livelihood, making people more independent of familial pressures and traditions, and high levels of circular migration spread urban ways of thinking.

Secondly, public policies in China and India have sought hard to increase gender equity, through a wide range of interventions aimed at changing people's perception that girls are less desirable than boys, as well as to bring women firmly into public life. These interventions include, *inter alia*, vigorous media campaigns to change ideas about gender roles and equity; legislation to enhance gender equity in the civil code; sponsoring grassroots women's organizations; and even financial incentives to parents to raise daughters.[34] This contrasts sharply with South Korea, where successive military regimes sought through their public policies to uphold muscular authoritarian Confucian traditions and keep women marginalized. These policies were gradually reversed only when three decades of military rule came to an end.

The South Korean case suggests that the Chinese and Indian governments have adopted the right approach to reduce son preference, by focusing heavily on interventions that seek to alter societal norms and accelerate the process of diffusion of new values — rather than relying only on measures such as increasing female education. It is notable that in China and India, public policies have sought to lead changes in social norms, whereas in South Korea public policies sought to *prevent* changes in social norms. Without these countervailing public policies, son preference may have declined in South Korea before it reached such high levels of development. This offers hope that in China and India, public policies will accelerate the process of change such that son preference may decline before they reach South Korea's levels of development.

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Figure 1. Juvenile (0-4 year) sex ratios in China, Republic of Korea, India, and Northwest India, 1950-2000
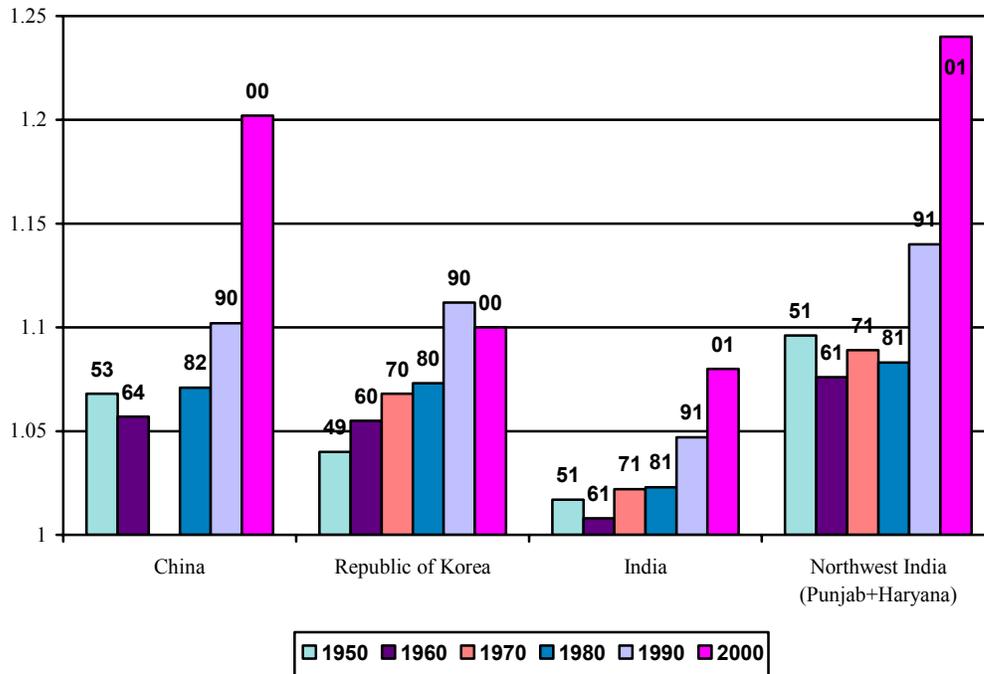
Source: Official national censuses for each country.

Notes: The numbers above the bars indicate the actual year that the census was taken. The data for India are for the age-group 0-6.

Figure 2.   Trends in the sex ratio at birth and the total fertility rate, S.Korea 1970-2005
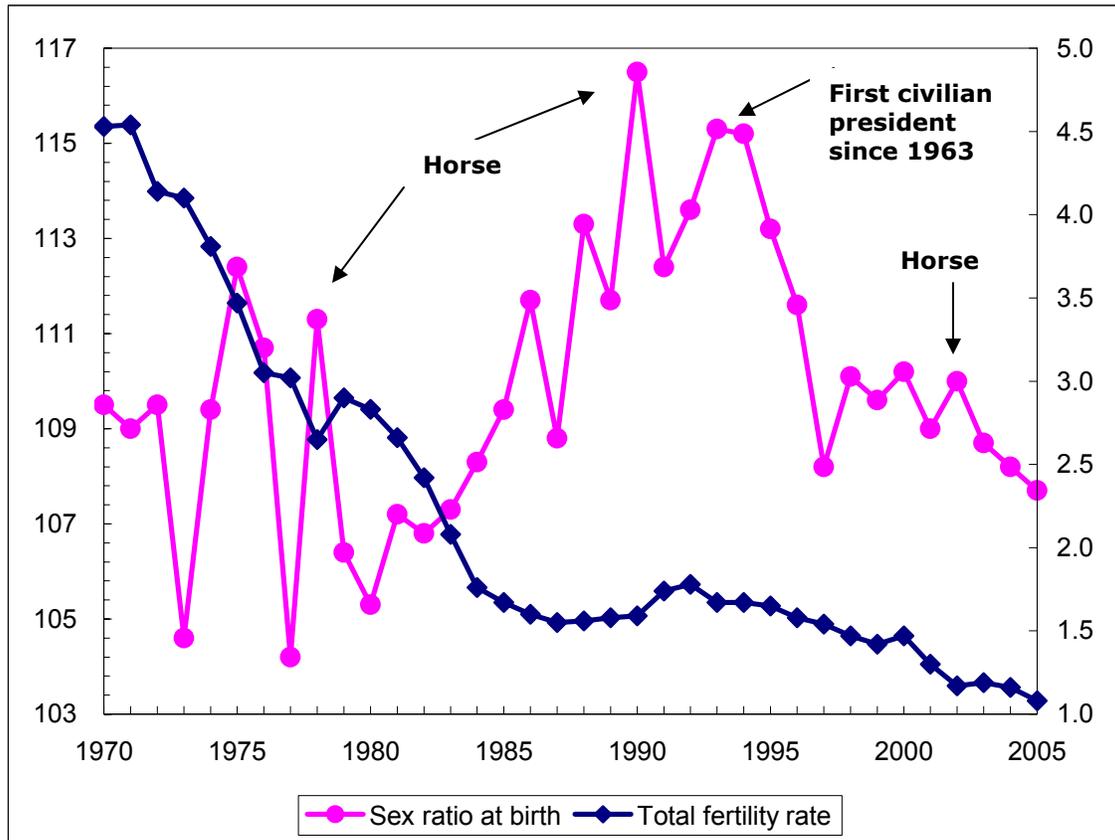
Source: Korea National Statistical Office, 2007

Figure 3.   Trend in the intensity of son preference (percent of women reporting "must have a son"), 1985-2003
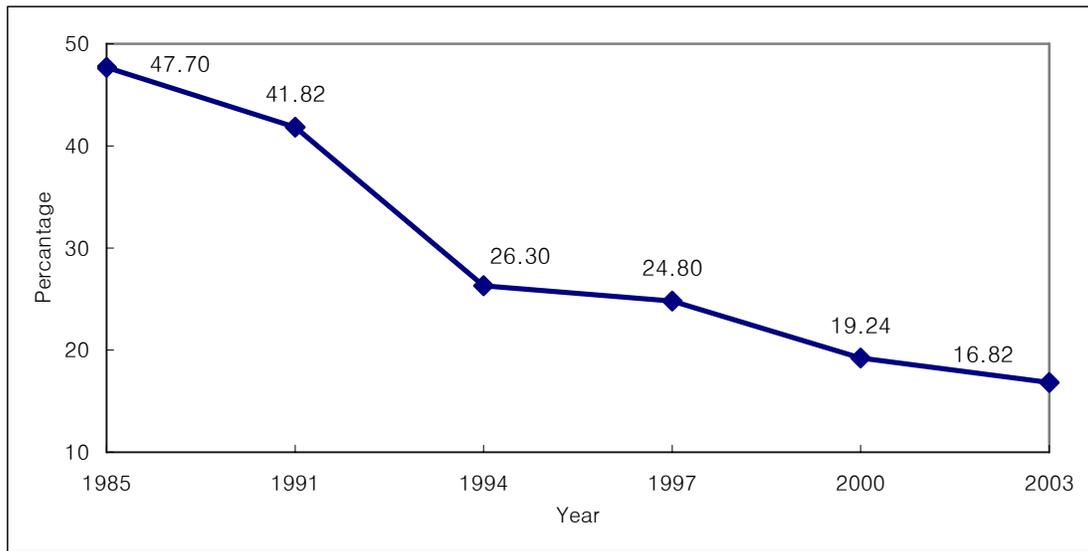
Source: Korean National Fertility and Family Health Surveys, various years.

Table 1.   Changes in levels of education and urbanization, South Korea 1975-2000

	1975	1980	1985	1990	1995	2000
Women's education*						
Elementary school or less	77.1	67.0	54.1	43.0	35.0	30.4
Jr high school completed	12.1	16.5	20.5	20.3	17.1	14.3
Sr high school completed	8.4	12.9	20.2	28.4	34.8	37.3
College completed or more	2.4	3.6	5.2	8.3	13.1	18.0
Men's education*						
Elementary school or less	53.1	42.8	31.9	23.3	17.8	15.1
Jr high school completed	17.7	19.8	20.5	17.6	14.2	12.3
Sr high school completed	19.7	25.4	32.1	38.9	41.4	41.6
College completed or more	9.5	12.0	15.5	20.1	26.6	31.0
Other development indicators						
% living in urban areas	50.9	68.7	74.3	81.9	86.7	88.4
%GDP from agriculture, fishery and forestry	27.1	16.2	13.5	8.9	6.3	4.9
Female Labor force participation rate (%)	-	42.8	41.9	47.0	48.4	48.8

Note: * This shows the highest level of education completed by women / men aged 25 or above.
Source: Korea National Statistical Office, 2006

Table 2.   Percent of women stating "must have a son", by birth cohort.

Birth year	1991		2003	
	N	%	N	%
1955-64	3416	35.04	2934	19.26
1965-74	627	27.11	2761	13.11

Source: Korean National Fertility and Family Health Surveys 1991, 2003.

Table 3.   Differences in family-building behavior by stated intensity of son preference, 2003

	Women stating "Must have a son"		All other women		All women	
	N	Sex ratio at birth	*N*	Sex ratio at birth	*N*	Sex ratio at birth
2nd birth and above						
At least one previous birth was a boy	*414*	104.95	*1838*	113.97	*2252*	112.25
All previous births were girls	*450*	194.12	*2149*	118.39	*2599*	128.58
Total	*864*	142.38	*3987*	116.33	*4851*	120.70

Note: N indicates the number of births from which these sex ratios at birth are derived.   The births are derived from the fertility histories, so all the births of the women in the sample are included here.   The woman's reported intensity of son preference is taken from a single question in the survey.

Table 4. Association of women's characteristics with the intensity of son preference, ever-married women aged 15-49 (Multivariate logistic regression analyses, DV=1 if the woman stated "must have a son")

Variable description	Women in 1991		Women in 2003		Women in 1991 and 2003 (Pooled)	
	Odds Ratio	P value	Odds Ratio	P value	Odds Ratio	P value
Woman's education						
Jr high school completion or less	1.00		1.00		1.00	
More than Jr high school	0.73	0.000	0.62	0.000	0.55	0.000
Sr. high school completion or more	0.73	0.017	0.49	0.000	0.47	0.000
Husband's education						
Jr high school completion or less	1.00		1.00		1.00	
More than Jr high school	0.88	0.082	0.99	0.914	0.86	0.009
Sr. high school completion or more	0.80	0.039	1.05	0.757	0.89	0.165
Woman's occupation						
No job	1.00		1.00		1.00	
White collar job	0.69	0.025	1.08	0.539	0.88	0.192
Blue collar job	1.03	0.605	1.13	0.134	1.12	0.018
Husband's occupation						
No job	1.00		1.00		1.00	
White collar job	1.30	0.142	1.20	0.337	1.19	0.165
Blue collar job	1.24	0.216	1.28	0.154	1.12	0.327
Residence						
Rural area	1.00		1.00		1.00	
Small city	0.52	0.000	0.83	0.069	0.60	0.000
Metropolis	0.33	0.000	0.67	0.000	0.43	0.000

Year of woman's birth

(1991 survey)	(2003 survey)					
< 1949	< 1960	1.00	1.00			
1950-1954	1960-1964	0.55	0.75	0.002	0.000	
1955-1959	1965-1969	0.49	0.67	0.000	0.000	
1960+	1970+	0.32	0.72	0.002	0.000	

Variable description	Women in 1991		Women in 2003		Women in 1991 and 2003 (Pooled)	
Woman's age at marriage						
< 20	1.00		1.00		1.00	
20-21	0.88	0.169	1.22	0.147	0.99	0.855
22-23	0.85	0.075	1.01	0.923	0.91	0.206
24-25	0.78	0.011	1.08	0.594	0.90	0.142
26+	0.62	0.000	0.78	0.075	0.68	0.000
Husband is the only son						
No	1.00		1.00		1.00	
Yes	1.35	0.024	1.65	0.000	1.62	0.000
Living with parent(s)						
Not living together	1.00		1.00		1.00	
Living together	1.32	0.000	1.03	0.795	1.15	0.015
Year of survey						
1991					1.00	
2003					0.34	0.000
Constant	1.21	0.000	-1.05	0.000	0.53	0.000
Log L		-4214.91		-2816.63		-7175.76
% Concordant		70.1		63.4		72.5
Sample size		6905		6482		13387

Note: All p values are based on the Wald test statistic.
Source: 1991 and 2003 Korea National Fertility and Family Health Surveys

Table 5. **Changes in the probability of stating "must have a son" 1991-2003**, ever-married women aged 15-49 (Univariate logistic regression analyses)

Variable	N	Odds Ratio	P value
Woman's education			
Jr high school completion or less			
1991	3350	1.00	
2003	1416	0.33	0.000
More than Jr high school completion			
1991	2894	1.00	
2003	3303	0.38	0.000
More than Sr high school completion			
1991	698	1.00	
2003	1803	0.36	0.000
Husband's education			
Jr high school completion or less			
1991	2188	1.00	
2003	1100	0.28	0.000
More than Jr high school completion			
1991	3082	1.00	
2003	2766	0.33	0.000
More than Sr high school completion			
1991	1666	1.00	
2003	2656	0.35	0.000
Couple's residence			
Rural area			
1991	1715	1.00	
2003	828	0.18	0.000
Small city			
1991	1817	1.00	
2003	2889	0.31	0.000
Metropolis			
1991	3416	1.00	
2003	2812	0.35	0.000

Note: All p values are based on the Wald test statistic.
Source: 1991 and 2003 Korea National Fertility and Family Health Surveys

Table 6. **Decomposition of the relative contribution of changes in population composition, and changes in social norms within given population groups, to the overall 1991-2003 decline in the probability of stating "must have a son"**

	Population composition			Social norms		
	Estimate	s.e.	z value	Estimate	s.e.	z value
Total decomposition	0.0673 **(26.90)**			0.1829 **(73.10)**		
Detailed decomposition						
Woman's education	(19.00)			(3.52)		
More than Jr high school completion	0.0134 (5.35)	0.0014	9.49	0.0015 (0.62)	0.0120	0.13
Sr high school completion or more	0.0342 (13.65)	0.0046	7.44	0.0073 (2.90)	0.0114	0.64
Husband's education	(2.49)			(-7.67)		
More than Jr high school completion	-0.0010 (-0.39)	0.0003	-3.06	-0.0100 (-3.98)	0.0104	-0.96
Sr high school completion or more	0.0072 (2.88)	0.0038	1.91	-0.0092 (-3.69)	0.0145	-0.63
Couple's residence	(5.41)			(-36.39)		
Small city	0.0284 (11.35)	0.0029	9.88	-0.0399 (-15.96)	0.0124	-3.21
Metropolis	-0.0149 (-5.94)	0.0008	-17.94	-0.0511 (-20.43)	0.0105	-4.85
Constant				0.2844 (113.65)	0.0086	32.89

Notes

1) The observed gap in son preference and the gap in the mean of the predicted probability between 1991 and 2003 are 0.25 and 0.25, respectively.

2) s.e. denotes standard error.

3) The numbers in parentheses denote the percentage contributions to the gap in the mean of the predicted probability.

4) Positive (negative) estimates represent positive (negative) effects on the reduction in son preference.

5) Estimates having z values more than 1.96 are statistically significant at 5% significance level.

Appendix: Methodology used for decomposition

In order to decompose the main factors underlying the decline in the probability of stating "must have a son" (intensity of son preference), we used the econometric method extended from original models within regression analyses suggested by Oaxaca and Blinder (Blinder, 1973; Oaxaca, 1973) to models of discrete choice with a binary dependent variable (Borooah & Iyer, 2005; Gomulka & Stern, 1990; Nielsen, 1998). Powers (2006) recently developed a supplicated method to overcome "a path dependence" problem that in nonlinear models, the independent contribution of one variable to the difference depends on the values of the other variables and on the order in which these variables are entered the decomposition. Applying his method, to the difference in the probability of stating "must have a son" between the respondents in the 1991 and 2003 surveys, we separated the contributions due to changes in "population composition" (differences in measured characteristics between cohorts) from contributions due to changes in social norms (differences in coefficients, or differences in the effects of those characteristics between cohorts). The econometric method can be explained as follows.

We have N (indexed, $i=1\ldots N$) women in mutually exclusive and collectively exhaustive cohorts, $k=1\ldots K$, each cohort containing N_k women. We may define the variable S_i such that $S_i=1$, if the woman stated "must have a son" and $S_i=0$, if she did not.   When we use a multivariate logistic model, the likelihood (or probability) of a woman, from cohort k, stating "must have a son" is

$$\Pr(S_i=1)=\frac{\exp(\mathbf{X}_i^k\hat{\beta}^k)}{1+\exp(\mathbf{X}_i^k\hat{\beta}^k)}=F(\mathbf{X}_i^k\hat{\beta}^k),$$

where $\mathbf{X}_i^k=\{X_{ij},\ j=1\ldots J\}$ represents the vector of observations, for woman i of cohort k, on J variables which determine the likelihood of the woman stating "must have a son", and $\hat{\beta}^k=\{\beta_j^k,\ j=1\ldots J\}$ is the associated vector of coefficient estimates for woman belonging to cohort k.

The average probability of a woman from cohort k stating "must have a son" is

$$\overline{P}(\mathbf{X}_i^k,\hat{\beta}^k)=N_k^{-1}\sum_{i=1}^{N_k}F(\mathbf{X}_i^k\hat{\beta}^k).$$

If we consider two cohorts, say women in 1991($k=1991$) and women in 2003 ($k=2003$), the difference in observed proportion of women stating "must have a son" between two birth cohorts ($\overline{S}_k$) is equal to the difference in the average predicted probability from models estimated for the two cohorts, or

$$\overline{S}_{1991}-\overline{S}_{2003}=\ \overline{P}(\mathbf{X}_i^{1991},\hat{\beta}^{1991})-\overline{P}(\mathbf{X}_i^{2003},\hat{\beta}^{2003}).\qquad\qquad(1)$$

If we want to decompose the overall difference into components that reflect changes in

population composition between cohorts and changes in social norms between 1991 and 2003, we can rewrite Eq. (1) as

$$\overline{S}_{1991} - \overline{S}_{2003} = \left\{ \overline{P}(\mathbf{X}_i^{1991}, \hat{\beta}^{1991}) - \overline{P}(\mathbf{X}_i^{2003}, \hat{\beta}^{1991}) \right\} + \left\{ \overline{P}(\mathbf{X}_i^{2003}, \hat{\beta}^{1991}) - \overline{P}(\mathbf{X}_i^{2003}, \hat{\beta}^{2003}) \right\}. \quad (2)$$

The first term appearing in the sum in Eq. (2) is the portion of the differential attributed to changes in population composition, which is the predicted probability of stating "must have a son" of the 1991 cohort minus the predicted probability of the 2003 cohort if the 2003 cohort faced the same social norms (coefficients) as the 1991 cohort. This component reflects the contribution to the differences that would have occurred if the two cohorts differed only with respect to population composition.

The second term in Eq. (2) is the portion of the differential attributed to changes in social norms (coefficients), which assesses the decline in the intensity of son preference that would have occurred if cohort characteristics were held fixed at the levels of the 2003 cohort.[35]

Suppose that we have M (indexed, $m = 1 \dots M$) observed characteristics. To obtain the contribution of each independent characteristic to the component of the difference in the women's intensity of son preference, we partitioned the portion of the differential attributed to changes in population composition and the portion of the differential due to changes in social norms into components that reflect the unique contribution of the mth covariate by weighting component.

The weighting component for the first portion is

$$W_{\Delta x_m} = \frac{(\overline{x}_{1991_m} - \overline{x}_{2003_m}) b_{1991_m}}{\sum_{m=1}^{M} (\overline{x}_{1991_m} - \overline{x}_{2003_m}) b_{1991_m}}$$

and for the second portion is

$$W_{\Delta b_m} = \frac{\overline{x}_{2003_m} (b_{1991_m} - b_{2003_m})}{\sum_{m=1}^{M} \overline{x}_{2003_m} (b_{1991_m} - b_{2003_m})}.$$

Here, $\sum_{m=1}^{M} W_{\Delta x_m} = \sum_{m=1}^{M} W_{\Delta b_m} = 1$.

Because the estimates do not provide information about the precision of the contributions to the difference in women's intensity of son preference, we derived standard errors of the detailed contributions to each component and conducted significance testing.

Endnotes

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[1] See Das Gupta et al (2003, 2004).

[2] This is documented for China in Das Gupta and Li (1999), and for North Korea in Goodkind (1999).

[3] See Klasen and Wink (2002) for a discussion of overall sex ratio trends for a large number of countries.

[4] For example, Toennies discussed a shift from *Gemeinschaft* (community) to *Gesellschaft* (purposive association); Maine a shift from status to contract; Durkheim, a shift from mechanical to organic solidarity, Weber a shift from behavior motivated by tradition, affect, or values to a goal-oriented rationality, and Parsons a shift from ascribed to achieved status.

[5] See for example, McClelland (1961), and Inkeles and Smith (1974).

[6] See for example, Rogers (1962) and Granovetter (1978).

[7] We are grateful to Mari Bhat for pointing out this distinction.   See Das Gupta and Bhat (1997).

[8] For example, more educated women in Punjab showed the largest disparity between the mortality rates of second and higher-order daughters, compared with their sons and firstborn daughters — being better able than uneducated women to use modern health practices to assure child survival, they applied their abilities more assiduously to assuring the survival of their wanted children (Das Gupta 1987). As the study pointed out, this did not mean that educated women had stronger son preference than others, merely that they were better able to implement their preferences.

[9] There is a large literature on the role of ideational change in shaping fertility behavior. See, for example, Lesthaeghe (1983) Bongaarts and Watkins (1996), Montgomery and Chung (1999).

[10] See also Janelli and Janelli (1982).

[11] Deuchler (1992:297).   See also Lee (1984), and United States (1990).

[12] As Martina Deuchler (personal communication) points out, the term "clan" is inadequatelyl-defined in terms of anthropological terminology.   As used in the Korean press and elsewhere, it refers to a high level of superordinate lineage, where men are linked by relationships stretching several generations into the past.

[13] See Das Gupta et al. (2004).

[14] Moon (2002:489), see also Whang (1981).

[15] Kim 1991, Das Gupta et al (2004).

[16] Lee (2001), Koo (2002).

[17] Private pensions cover a very small percentage of people, even today. The universal social pension system started in 1999, but only a small number of people receive it and the sums are small.

[18] We are grateful to Minja-Kin Choe for drawing our attention to this.

[19] Prendergast (2005) discusses how daughters offer gifts and physical help to their parents, and thereby maintain a bond of mutual support even after they are married. He also discusses sons' and daughters' changing roles in caring for their old parents.

[20] See Das Gupta et al. (2004).

[21] Field interviews conducted by Bae Hwa-Ok and Monica Das Gupta in 1996, see Das Gupta et al (2003).

[22] See for example, Cho (2002), Koo (2002), and Moon (2002).

[23] Kim and Song (2005) show the correlation between Buddhism and son preference. Park and Cho (1995) show that son preference is highest in the Eastern region, where Buddhists are concentrated. For a discussion of the relationship between son preference, religion, and induced abortion in South Korea, see Chung (forthcoming).

[24] Insook Park and Leejay Cho (1995), United States (2005); Kim and Song (2005). In the 1991 Fertility and Family Health Survey, Buddhists and Christians each constituted about 30 percent of the population, those with "no religion 39 percent, and the remainder including Confucians less than 1 percent.

[25] Kim and Song (2005), Park and Cho (1995). For a fascinating anthropological account of how Confucianism permeated Korean society, see Walraven (1999).

[26] See for example, Cho (1998), Insook Park and Leejay Cho (1995), Kim (2004), Kim and Song (2005), and United States (2005).

[27] Powers (2006) noted that the constant term represents a shift (i.e. a change that cannot be attributed to change in model coefficients and model covariates).

[28] The discussion in this paragraph draws on Choe (1987), Choe and Kim (1998), Das Gupta and Bhat (1997), Das Gupta et al (2003), and Larsen et al (1998).

[29] See Lee and Paik (2006).

[30] Prendergast (2005) describes how parents can no longer just expect to be cared for by their children as a matter of right, but instead need to negotiate a good relationship with them, including through offering childcare or financing to buy a house.

[31] We found significant associations among three variables consisting of population composition. For example, the gamma statistic between woman's education and a couple's residence was 0.33(p value=0.000) in 1991 and 0.25(p value=0.000) in 2003; and that between woman's education and husband's education 0.93(p value=0.000) in 1991 and 0.91(p value=0.000) in 2003.

[32] See for example Rogers (1962), Granovetter (1978) and Montgomery and Chung (1999). For an application to demographic trends, see Bongaarts and Watkins (1996).

[33] See Das Gupta et al (1999, 2003, and 2004).

[34] For descriptions of the media campaigns see Naqvi (2006) for India, and Das Gupta et al (2004) and Croll (2000) for China and India. For the proposed national financial incentive programs in China, see Xinhua (2006), and for India see The Hindu (2006). Various Indian states have had incentive programs in place since the early 1990s. Perhaps the most notable example is "Apni Beti Apna Dhan" which offers cash to women when they give birth to a girl, and sets aside a sum of money to be encashed when the girl turns 18. This was started in Haryana state in 1994, and taken up by several other states. A version of this is now under consideration for financing by the central government.

[35] By switching the reference cohort by comparison cohort, we obtained an alternative decomposition. However, two approaches showed very similar results.