# The Role of Gender Preference to the Third Birth in Japan: Magnitude, Trends and Implications

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**Abstract**

To evaluate the role of gender preference to the third birth fertility in Japan, we focus on the difference in the parity progression ratios by the sex composition of previous two children. We model that progression probability is affected by balance preference (desire to have a son and a daughter), son preference and daughter preference in addition to baseline risk of having the third birth. Using the birth history data from the national fertility surveys, we calculate the period parity progression ratios from the 1930s to the 2000s. We found that the positive effect of gender preference still exists and patterns have changed over times. Son preference effect, which was prominent in the 1950s and the 1960s, has been declined. After the period of balance in son and daughter preference, daughter preference exceeds son preference after the 1990s. We will discuss the associated gender role attitudes in Japan.

**Introduction**

In the first fertility transition and the second fertility transition in Japan, the change in the third birth fertility rate hugely contributed to overall fertility decline. As many scholars suggested, determinants of childbearing vary with birth order, and it is well-known that sex preference plays an important role to the decision making to have a third birth. That is, when the first and the second children are the same sex, the probability of additional childbirth is significantly higher than other cases (Morgan and Hagewen 2005). This phenomenon can be explained by gender role attitude (Pollard and Morgan 2002, Hank and Andersson 2002, Andersson et al. 2006). In this paper we calculate period parity progression ratio from the second to the third birth and observe this by the sex composition of the previous birth over a couple of decades since the mid-20$^{th}$ century. We explain how the change in the gender role attitude affect fertility decline in the third birth.

**Backgrounds**

**(1)Gender preference and the higher-order birth fertility rate**

Although there are a lot of determinants of an additional childbirth, determinants are different between birth orders. It is often said that the first birth is desired for the couple, the second birth is desired for the first child to have sibling, and the third and higher births are desired to have a child of different sex from the children already the couple have, otherwise mistakes.

In Western Society, as modern industrial society had developed, gender-balanced family - it consists of father, mother and (at least two) children with different sex - had been recognized as a perfect family (Gillis 1992). In the society where such preference for a balance of daughters and sons (a desire to have at least one child of each sex) is strong, having only the same sex children was an important factor to have additional fertility intention. In Eastern Asian counties where Confucianism affects various social systems including family system, traditionally son preference is

relatively strong. Overall we expect that as gender role is strong in the society, the progression ratio to the third birth become larger.

**(2)Gender role and fertility decline**

It is also suggested that fertility decline in developed society is largely caused by change in the gender role system in society. Changes in gender role, however, emerged in the various areas of social system and individual behavior and attitude, and the ways of affecting fertility are not simple. In general, educational improvement and rising earing power among women contributes to lower fertility, especially in fertility transition from high to low (replacement) level. However, as McDonald stated, when gender equity in individual-oriented institutions is not accompanied by gender equity in family-oriented institutions, the further movement to very low fertility is observed in many countries including Japan. Increasing gender equality should also affect gender preference of parents, and whether a shift toward gender equality occurs in only individual institutions such as education and market employment or in domestic institution as well would have different impact on the changing pattern of gender preference of childbearing. This change in gender preference may influence to fertility through the probability of additional childbearing.

Distinguishing types of gender equality can be applied not only in individual-oriented institutions and in family-oriented institutions. It can be applied to difference in generation: mothers' generation and daughters' generation. In the process of a shift toward gender equality, society often experienced that older generation faces strong gender-oriented roles, while younger generations live in more gender symmetry society. In transition phase, specific pattern may be observed in gender preference.

**(3)Gender preference for children in Japan**

There are various patterns in Gender preferences in the world, but most common ones are a son preference and balanced preference (a desire to have at least one child of each sex). In a band of countries from North Africa through the Middle East and South Asia to East Asia, son preference is strong (Arnold 2003). On the other hand, in European countries a balanced preference is relatively common (Hank and Kohler 2000) and Pollard and Morgan (2002) suggested that weakening of gender preference as a shift toward gender equality in the United States. However, Andersson et al. (2006) suggested that even in the fairly gender equal Swedish society, a clear preference for one child of each sex has continued to exist, and the relationship between gender role equality and gender preference is still an open question.

Japan is an East Asian country and share a lot of cultural aspect with Korea and China, but son preference is not so strong compared with these countries (Moriizumi 2008). Rather according to

the sex composition of aggregated ideal number of children among married women, since the late 1980s, more girls are desired than boys (the ratio for girls is 53.5% and that for boys is 46.5% in the 2010 survey) (NIPSSR 2012). As for the association between gender role attitudes and gender preference, Moriizumi (2008) and Fuse (2013) found that daughter preference of women links to strong gender role attitudes or expectation of care by children in their old age.

Gender preference in Japan has played an important role to fertility. Sakai (1994) examined that the number of planed additional fertility is on average higher among married women who have gender preference for children. He also found that the risk of induced abortion is also influenced by the composition of sex of children ever born (Sakai 1992). Moriizumi (2008) demonstrates using more recent data that fertility intention for the third birth is the highest among couples with two boys. This means that desire to have at least one daughter is stronger than the desire to have a boy.

These previous studies told us that Japanese people still have gender preference and daughter preference may boost up fertility recently. However, we know little about the relationship between gender preference and fertility for the long term. In this paper, using birth history data of large sample surveys conducted every 5 years since the 1970s, we calculate period parity progression ratios by sex composition of children ever born and examine how gender preference contribute to decision making of additional childbirth.

**Table 1: Percentages of couples by ideal combination of boys and girls, by survey and ideal number of children**

| Ideal combination of boys and girls | | 8th Survey (1982) | 9th Survey (1987) | 10th Survey (1992) | 11th Survey (1997) | 12th Survey (2002) | 13th Survey (2005) | 14th Survey (2010) | |
|---|---|---|---|---|---|---|---|---|---|
| 1 child | 1 boy/0 girls | 51.5 % | 37.1 | 24.3 | 25.0 | 27.3 | 22.2 | 31.3 | N=83 |
| | 0 boys/1 girl | 48.5 | 62.9 | 75.7 | 75.0 | 72.7 | 77.8 | 68.7 | |
| 2 children | 2 boys/0 girls | 8.8 % | 4.1 | 2.7 | 2.1 | 1.9 | 2.2 | 1.9 | |
| | 1 boy/1 girl | 82.4 | 85.5 | 84.0 | 84.9 | 85.9 | 86.0 | 87.9 | N=1,988 |
| | 0 boys/2 girls | 8.9 | 10.4 | 13.3 | 13.0 | 12.2 | 11.8 | 10.2 | |
| 3 children | 3 boys/0 girls | 0.7 % | 0.5 | 0.3 | 0.4 | 0.6 | 1.1 | 0.9 | |
| | 2 boys/1 girl | 62.4 | 52.3 | 45.1 | 38.4 | 41.6 | 38.5 | 40.7 | N=1,470 |
| | 1 boy/2 girls | 36.2 | 46.2 | 52.9 | 58.9 | 55.4 | 58.3 | 55.4 | |
| | 0 boys/3 girls | 0.7 | 0.7 | 1.6 | 2.3 | 2.4 | 2.1 | 3.1 | |
| Sex ratio in ideal number of children 100 x (ideal number of boys/ideal number of girls) | | 105 | 99 | 91 | 85 | 87 | 86 | 87 | |

Source: Japanese National Fertility Surveys (NIPSSR 2011).

**Analytical strategy and methods**

Given that sex pre-selection is very rare, among couples who have two children, the composition of sex of children should be determined randomly. We calculate period parity progression ratio by the composition of sex of children and compare boy-boy case and girl-girl cases with mixed sex cases. If the relative risk of the parity progression of parents having only two boys is higher than other cases,

this is considered to reflect that expectation to have a daughter would increase fertility.

The period parity progression ratio from the second to the third birth can be calculated from birth history data from survey data (Feeney 1986). Let ${r_E}^i(y)$ denotes the proportion of women having an ith birth in year y who have an (i+1)st birth in the same year, and let ${r_x}^i(y)$ denotes the proportion of parity i women with x completed years duration in parity at the beginning of year y who have an (i+1)st birth during year y. The cohort parity progression ratio ${P^c}_i(y)$, which is the proportion of women having an ith birth in year y who ever have an (i+1)st birth, is expressed as below.

$$ {P^c}_i(y) = 1 - [1 - {r_E}^i(y)] \prod_{x=0} [1 - {r_x}^i(y + x)]. $$

The period parity progression ratio ${P^p}_i(y)$ (PPPR), which is the ratio that would be observed in an hypothetical cohort that experiences the parity progression rates of year y, can be defined by

$$ {P^p}_i(y) = 1 - [1 - {r_E}^i(y)] \prod_{x=0} [1 - {r_x}^i(y)]. $$

We calculate the PPPR by the sex composition (and order) of previous births: a boy and a boy, a girl and a girl, and mixed sex.

**Data**

We use the Japanese National Fertility Survey data conducted by the National Institute of Population and Social Security Research in 1977, 1982, 1987, 1992, 1997, 2002, 2005 and 2010. Each survey includes around 6000 first married couples and response rates are around 90 percent. From the 1982 through 2010 survey, age of married women is from 18 to 49. The 1977 survey has married women from 18 to 86.

The birth history includes the date of child birth by birth order and sex of each child. The births include multiple births. We found that the results were not changed much when we calculated the PPPR to the exclusion of multiple births. In this study we show the results including all women having at least two children.

We prepare person-month data from the date of the second birth to the date of the third birth or the date of survey. We obtain risk population and event cases by year from 1918 to 2010. To use enough sample to reproduce a period schedule of parity progression ratio, we limit observation period from 1935 to 2009.

**Results**

The period parity progression ratios can be calculated by birth order. Figure 1 show the PPPR from the first to second birth by the sex of the first birth. The progression ratio by the sex of a first child seems almost identical.

**Figure 1: Period parity progression ratio from the first to the second birth by the sex of previous child**

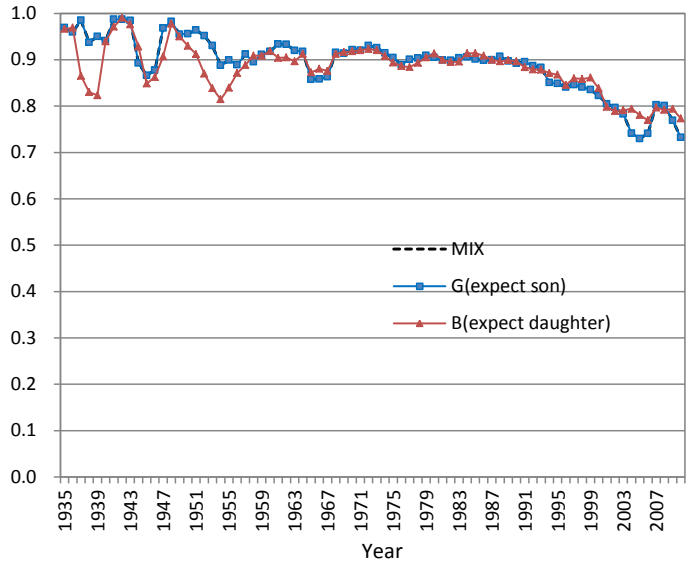


**Figure 2: Period parity progression ratio from the second to the third birth by the sex composition of previous children**

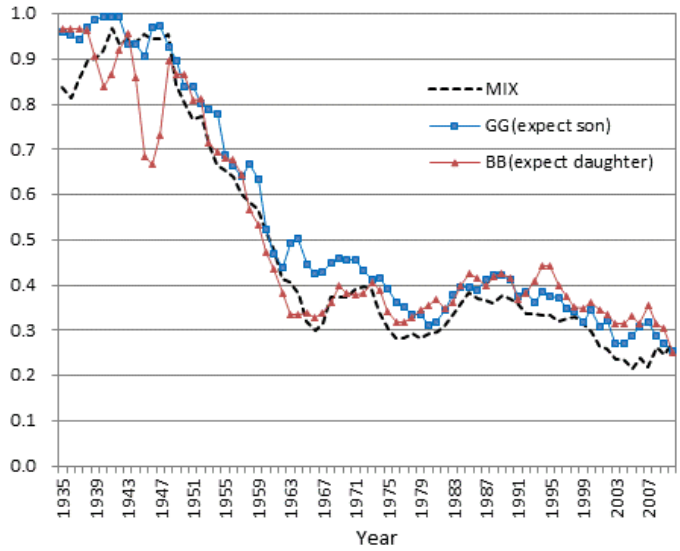


Figure 2 shows that PPPR from the second to the third birth. We can see that the PPPRs for the same sex children are much higher that mixed-sex children. Since the overall PPPR has been declined dramatically during the 1950s and the 1960s and after 1990s, the progression ratio shows the declining trend. To focus on the effect of gender preference, we show the difference in the PPPR of the same sex children from the mixed children as a base line. We don't see any attenuation of the same sex children effect which is suggested in Pollard and Morgan paper for the US (Pollard and Morgan 2002). Furthermore, contributing factor has changed apparently. In the late 1950s and the early 1970s, the PPPR for only daughters was much higher than only sons. That is, desire to have at

least one son would be much stronger than having a daughter. In the late 1970s, although the effect of the same sex children still exists, the difference between only daughter and only son seemed disappeared. After the 1990s, another phase began. The PPPR for the only sons became much higher than that for the only daughters, which means that having at least one daughter is much more desired than having one son.

**Discussions**

Parental gender preference has become much stronger since the 1960s. Most importantly, after fertility transition in the 1950s, superiority in gender preference is reversed. In the late 1950s to the earlier 1970s, son preference was relatively strong. After showing gender indifference period in the 1980s, daughter preference effect has exceeded since the 1990s. These changes in the magnitude and pattern of gender preference should be related with gender attitude or gender role in the Japanese social system. We will discuss this aspect and speculate future prospects.

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