An Empirical Study of Sex Preferences for Children in Japan

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Introduction

In the 1970s, the "value of children" (VOC) project was promoted for the purpose of investigating social, economical, and psychological factors of fertility behaviors, at the initiative of the East-West Center, East-West Population Institute in Hawaii. This survey discovered the fact that the economical values of children drop while their psychological values rise according to the progress and modernization of the social economy (Arnold et al. 1975; Buratao 1979). It was uncovered that people's perception of values of children changes according to social transitions, and consequently influences their fertility intention and fertility behavior.

The values of children vary depending on the sex of the children, and people's interest in the sex of children changes depending on the system and culture of the society in which their parents lead their lives. The social roles played by men and women are of particular importance. The larger the gender disparities, the clearer the parents recognize the different values placed on sons or daughters, which determines sex preferences, i.e., which sex is preferred for their children and what sex combination is preferred.

Typically, sons are expected to play the roles of heirs of the family and bread-winners while daughters are expected to help with domestic duties and child rearing and/or bringing about close family ties (Arnold and Kuo 1984). Moreover, mothers are said to have a sense of closeness to daughters and fathers to sons. Since the roles of sons and daughters are thus different, a tendency of son preference, i.e., hoping to have more sons, in particular, has become widespread, while standard married couples prefer to have at least one son and daughter, each. This tendency is closely related to the fact that many societies have developed systems or cultures in which the socioeconomic position of men is more advantageous than that of women. Recently, however, the trends of sex preferences have become more diversified and are no longer limited to son preference only; indeed, there are countries today where many people do not care particularly about the sex of their children or even have daughter preference.

At this moment, in many of the advanced nations that exhibit fertility rates below the replacement level fertility, clarification of the determinants of fertility behavior has become essential in order to obtain clues for political measures related to this issue. In the process of deciding to have (additional) children, not only the parents' social, economical, and physical attributes at that point, but also their desired number

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of children and preferences on the sex composition are considered to be involved. In this sense, it would be significant to investigate how parents' sex preferences for children influence their fertility behaviors.

Based on the perception of the issues above, this paper provides an overview on the knowledge obtained from precedent researches related to sex preferences first and then use the survey data of the eighth (1982) to 13th (2005) "Japanese National Fertility Survey" to shed light on the development of sex preferences in Japan in the past 20 years. Moreover, multivariate analysis is used to investigate whether or not sex preferences influence parents' fertility intention for a second and/or third child.

I. Findings from Previous Studies

There are many different variations in sex preferences for children, but they can largely be classified into four patterns: son preference, daughter preference, balance preference (equal number of sons and daughters; this is sometimes taken to mean at least one son and one daughter), and no preferences. The most common pattern is the son preference, which can be observed in a wide range of the globe, from North Africa over the Middle East, to South Asia and East Asia (Arnold 1997; 2003). The classifications can be sub-divided further by connecting the preferred sex with the birth orders, such as a son or daughter being preferred as the first child. The manifestation of sex preferences also depends on the sex of the respondents; men tend to prefer sons and women tend to prefer daughters (Arnold and Kuo 1984). Moreover, sex preferences are deeply related to the number of children as well. If the number of children is an odd number, respondents tend to state a preference, either son or daughter. If the number of children is an even number, on the other hand, the respondents often select balance preference, i.e., the same number of sons and daughters.

Since people's interest in the sex of children has been influencing their fertility behaviors, it is bound to eventually influence the population size and demographic structure. Child deaths due to sex selective induced abortion, infanticide, and neglect after birth can become a factor that distorts the sex ratio at birth and in the general population, and the ethical issues involved are serious as well. If the distortion of the sex ratio at birth becomes too large, it may give rise to marriage difficulties in the future due to lack of male or female population. Moreover, tendencies toward not engaging in contraception until a preferred sex composition of children is achieved, for example, may delay fertility transition of a given region and affect the development of the population size.

In days gone by, cases of sexual selective infanticide distorting the ratio between the sexes were observed in some regions. Since the 1980s, however, methods have been

developed that allow very certain sex determination at early stages of the pregnancy at low costs. As a result, selective induced abortion based on the child's sex became possible, which caused some regions to have distorted sex ratios at birth (Goodkind 1996; Das Gupta 2005; Andersson et al. 2007). Since these cases are commonly based on son preference, most of the targets of sexual selective infanticide and abortion are daughters. This trend is observed in some countries in Asia, in particular, and many studies focusing on case examples of regions or countries where son preference is strong, such as China, India, South Korea, Vietnam, and Nepal, analyzing the trends of population by sex and/or sex ratio at birth along with the socioeconomic and cultural factors causing son preference, have been published (Arnold and Zhaoxiang 1986, Zeng et al. 1993, Chu 2001, Scharping 2003, etc., on China; Park 1983, Arnold 1985, Park and Cho 1995, Kim 2004, etc., on South Korea; and Das Gupta and Bhat 1997, Clark 2000, Arnold et al. 2002, Bhat and Zavier 2003, etc., on India).

In more advanced Western nations and Japan, although noticeable changes in sex ratio at birth are not seen, sex preferences are taken up as one of the determinants of fertility behaviors. Moreover, there are many studies focusing on the facts that some countries are moving from the son preference type in the past toward dilution of sex preferences and/or daughter preference type.

Hank and Kohler (2000) investigated the relationship between fertility intention for the third child and the composition of existing children's sexes using the Family and Fertility Surveys (FFS) in 17 European countries and found out that many countries commonly indicate balance preference even though socioeconomic conditions and family policies are different for each region.

Various studies have dealt with individual countries; Brockmann (2001) and Hank and Kohler (2003) concentrated on Germany. Brockmann (2001) investigated how sex preferences among women born in different periods from the time of the German Empire to the present changed in correlation with social system transition. Brockmann stated that sex preferences were not lost with modernization, but the pattern seems to be connected to the form of welfare policies. Hank and Kohler (2003) conducted an empirical analysis on determinants of sex preferences in Germany as well as the relationship between fertility intention and sex preferences. They found that respondents' age, sex, education, whether or not they have children, and sex of the first child have significant influence on their sex preferences for children. The result indicated that parents' fertility intention for a second child is weakened if the first child is a son compared to when the first child is a daughter, but no significant effects were observed for the third child.

In France, Breton et al. (2005) concluded that, in case of married couples with two children, the existing children's sex composition influences the probabilities of having a third child.

In the US, the relationship between sex preferences and fertility behavior has

been researched since the 1930s (Sloane and Lee 1983). Dahl (2004) is a recent study, where an empirical analysis of the childbearing probability of the third child among parents having two children was carried out. The results indicated that the childbearing probability is higher among married couples having only daughters than married couples having only sons. Moreover, Pollard and Morgan (2002) argued in their empirical study using data collected in the US during the 1980s and 1990s that as the gender system of the society changed toward the direction of equality between the sexes, the parents' sex preferences weakened, and the influence of sex preferences on the third child fertility behavior declined. However, Brockmann (2001) and Andersson et al. (2006), who analyzed data of Scandinavian countries, concluded that this relationship between modernization and dilution of sex preferences may not necessarily be a foregone conclusion, and no unified opinion has been reached yet.

Several previous studies on sex preferences for children, focusing on both developing countries and developed countries, point out that the patterns and changes of sex preferences are more closely related to sociocultural homogeneity rather than socioeconomic conditions (Krishnan 1987; Arnold and Kuo 1984; Hank and Kohler 2000; Andersson et al. 2007). Japan, however, is an exception. Although it shares several cultural background aspects commonly with other Asian nations such as China and South Korea, a clear son preference is no longer observed in Japan.

Let us overview the conditions in Japan. In Japan as well, interest in the sex of children has been high since old times, and there was strong tendency to prefer sons. Until around the Edo period, attempts of sex determination via fortune-telling before birth and/or of changing the sex of fetuses by magic spells were common practice and exercised in many places (Shinmura 1996). However, since reliable sex determination before birth was difficult, people's sex preferences were realized by infanticide after birth. Kawaguchi (2002) and Tsuya (2002) analyzed data obtained from historical records from the Edo period and found that sex preferences were associated with infanticide behaviors.

Such conditions did not continue after the Edo period. In the Meiji period and onward, sex ratio at birth in Japan stabilized to a natural range (about 105 to 106). The same is true even when the data is examined by birth order. Thus, it is safe to say that sexual selective induced abortion and/or sex-choice birth have not been exercised in Japan on a scale large enough to have any influence on the statistics. Probably for this reason, there have not been many studies in Japan focusing on the relationship between sex preferences for children and fertility behaviors.

One of the few researchers who investigated this theme is Hiromichi Sakai, who published a series of study results. Sakai (1989) used "the eighth National Fertility Survey (1982)", the same data as used in the present paper, and investigated the influence of sex of children on fertility behaviors. As a result, it was found that the average value of the intended additional number of children was higher in cases where

parents have an ideal for sex combination of children compared to cases when they do not have any preferences. He also pointed out the possibilities that the sex composition of existing children influences the exercise of abortion in cases of married couples with two or more children. Moreover, Sakai (1992) stated that the interest of wives in the sex composition of children has been rising and some tendencies toward daughter preference have been observed.

Nishioka (1994) used statistical data of Okinawa and analyzed sex preferences and contraception. It was found that there is a tendency toward son preference in Okinawa, and in particular among people aged 30 and over, there are many cases where the people have additional children in order to have sons, given the sex composition of existing children.

Moreover, Fuse (2006) is one of the studies that used the 11th Japanese National Fertility Survey/Single Survey (1997) and performed an empirical analysis on the influence of changes in gender consciousness in Japan on sex preferences (especially daughter preference) of unmarried people. The study indicated that the influence of views of gender roles related to marriage/families on sex preferences for children is different between men and women. Because traditional gender views still remain in Japan, the probability of unmarried men to favor son preference was higher among those with traditional gender views, while daughter preference was associated with non-traditional gender views. On the contrary, women with traditional gender views showed higher probability of having daughter preference. Fuse speculated that this is because the traditional factors associated with the gender roles of daughters, such as closeness with the mothers and providing support in their old age, are acknowledged and appear attractive to women.

The review of previous studies on sex preferences thus shows that a broad array of themes have been studied, such as the current conditions of sex preferences, analysis of sociocultural factors of time-series development, and analysis of influence on demographic structure and/or fertility intention/fertility behaviors. Based on the knowledge obtained from such researches, this paper examines how sex preferences have been changing in recent 20 years in Japan and the causes of the development. Additionally, this paper investigates if any significant correlations can be found in the relationship between sex preferences for children and fertility intention from the Japanese data.

II. Development of Sex Preferences in Japan in Recent 20 Years

1. Data

For the analysis of time-series development of sex preferences, data of the eighth

(1982), ninth (1987), tenth (1992), 11th (1997), 12th (2002), and 13th (2005) Japanese National Fertility Survey/Married Couple Survey and Single Survey data is used. The married couple survey targeted wives of first-married couples, while the single survey targeted never-married people. For both surveys, the target age range was less than 50 years of age. Note that the survey targets of the eighth and ninth single surveys were never-married people younger than 35 years of age; data for the age groups 35 to 49 is not available.

In the married couple survey, the respondents were asked if they had any ideals for number of children and sex combination. The ideal number of children revealed by the married couple survey was obtained from responses to the question, "What is the ideal number of children for you and your husband?" which indicates the number of children a couple would like to have if they could have as many children as possible without consideration to physical/socioeconomic restrictions. Apart from this, the number of children a couple actually plans to have was investigated as "intended number of children." It was found that the ideal and intended number of children match in approximately 60% of the respondents. Note that, in case of the married couple survey, the questions were phrased to solicit the views of couples, but the actual people answering the questions were wives. It is thus necessary to keep in mind the fact that the personal views of the wives may have a significant impact on the answers.

In the single survey, the respondents were asked their desired number of children and if they had any sex combination preferences. In the single survey, the desired number of children was obtained from responses to the question, "How many children do you want to have?" The average value of the overall total of the data shows values similar to the intended number of children in the married couple survey. For this reason, it can be said that the desires stated by many of the respondents tend to be more realistic than the "ideal" in the married couple survey.

Note that in the analysis, responses of wives were aggregated by dividing the subjects into two groups: wives with children and wives without children. This was done because in case of wives with children, there is a possibility that the actual experience of childbirth/child-rearing influences responses of the ideal number of children and the sex combination (Miller and Pasta 1995; Moriizumi 2004). Indeed, some differences can be observed in the average ideal number of children between wives with children and wives without children. Looking at Figures 1-1 and 1-2, the average ideal number of children of wives with children is exceptionally high. The same trend can clearly be observed among young generations, where many of people who are highly willing to get married and/or giving birth are found in the categories of respondents without children and never-married people. The average ideal number of children of wives without children indicates values rather closer to the average desired number of children of never-married men/women. It is likely that whether the respondents have children or not, rather than whether they are married or not, has

more influence on their attitudes regarding the number of children. Note that the category of wives without children is likely to include many respondents who have difficulties having children due to sterility and other physical restrictions as well as persons who do not want to have children in the first place. In any case, it is considered significant to aggregate data of women without children separately and compare the results.

Figure 1-1
Average Ideal/Desired Number of Children: Total Number (8th to 13th Surveys)

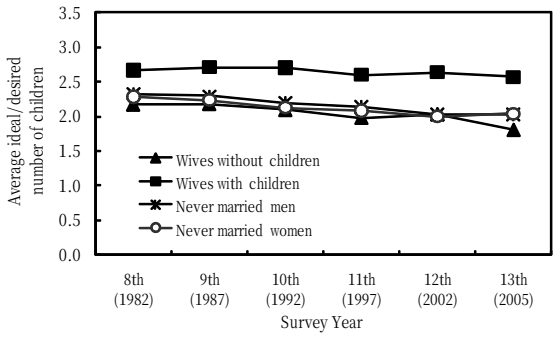
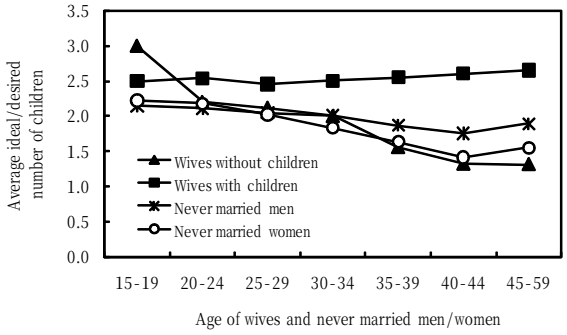


Figure 1-2
Average Ideal/Desired Number of Children by Age Groups: 13th Survey (2005)



Note: Data on wives less than 50 years of age of first-married couples, and never-married men and women who intend to get married in their lives (subjects who are younger than 35 years of age only for the 8th and 9th surveys). Respondents who are uncertain about the ideal/desired number of children are excluded.

2. Development of Sex Preferences in Japan: Result of Cross Tabulation

This section observes the development of sex preferences in Japan based on the results of cross tabulation. First, the trends in people having or not having any preferences for combination of sexes of children, as well as specific preferred combinations, are reviewed, followed by an examination into the relationships between reasons for having children and sex preferences, and a discussion on factors involved in recent changes.

(1)Percentages of Subjects Having/Not Having Ideals/Desires for Combination of Children's Sexes

We asked respondents whose ideal/desired number of children is one child or more about the breakdown of preferred sexes[2]. Figure 2 shows the calculated percentages of subjects who have/do not have any ideals/desires for combinations of children's sexes in the eighth to 13th surveys, for wives with children and wives without children, as

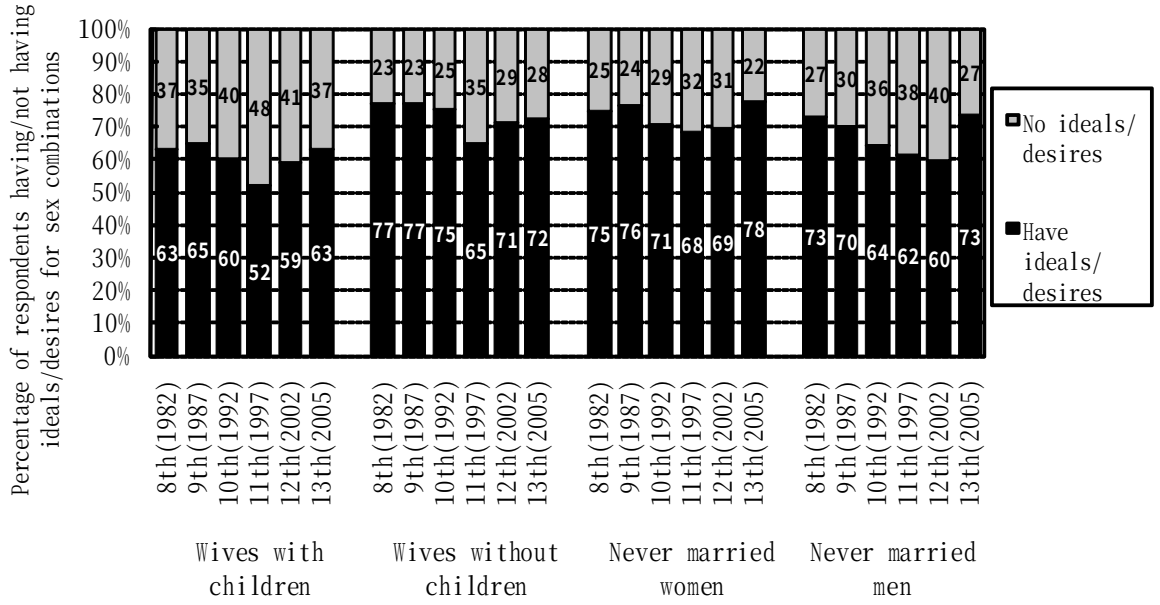
[2] Please refer to Appendix Table 1 for the number and percentage of samples whose ideal/desired number of children is 0. Percentages of married women and never-married men/women who responded their ideal/desired number of children as 0 is very small; more than 90% of them responded that their ideal/desired number of children is one or more children.

well as never-married men and never-married women, respectively.

The percentage of subjects who "have ideals and/or desires" exceeded 50% for both wives and never-married people in all the surveys; it is safe to say that the interest in combinations of children's sexes is high. Note, however, that the percentage of respondents expressing specific desires for combinations of children's sexes decreased in the period from the 1980s to 1990s. From the 11th survey (1997) and onward, the percentage of subjects having desires levels off in the 12th survey (2002) and the percentage of respondents having ideals/desires increased slightly in the 13th survey (2005).

Comparing responses between wives with children and wives without children, a higher percentage of wives without children have certain ideals for sex combinations compared to wives with children. In case of never-married people, the percentage of subjects having desires for sex combinations is higher for women than men. Among the categories here, the percentage of respondents who have no particular preferences for sex combinations is the highest among wives with children.

Figure 2 Percentages of Respondents Having/Not Having Ideals/Desires for Combinations of Children's Sexes by Marital Status /Having or Not Having Children (Wives with/without Children and Never-married Men/Women) by Survey Year

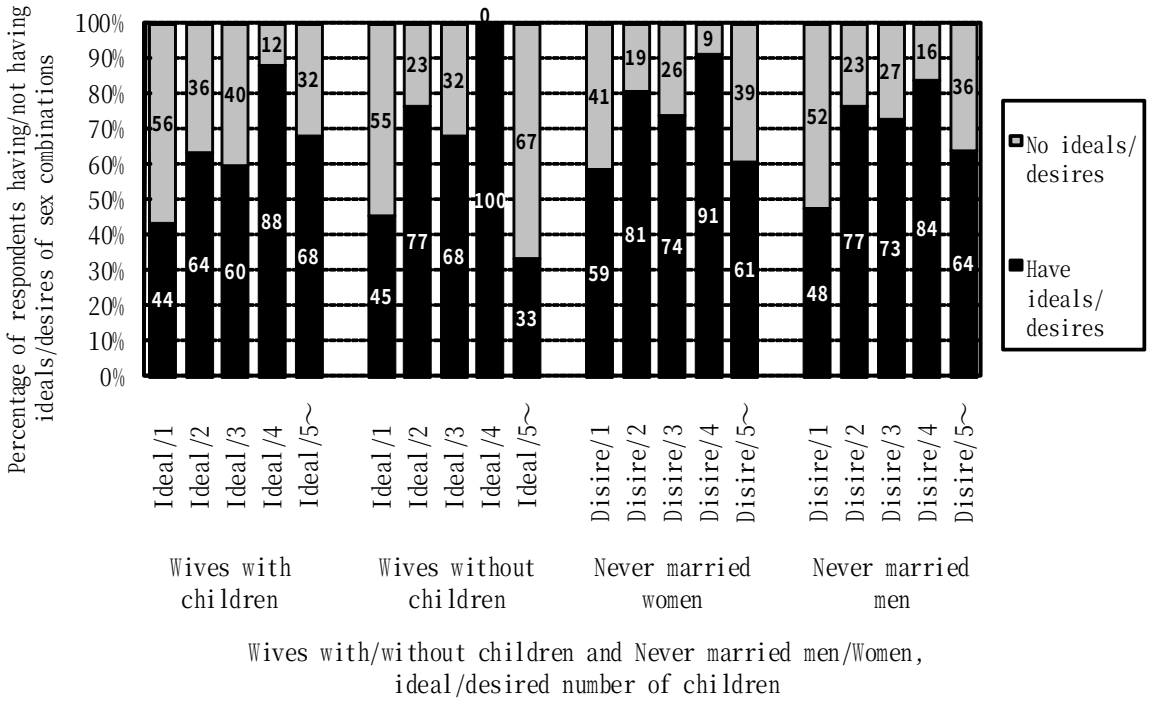


Note: Data on wives less than 50 years of age of first-married couples, and never-married men and women who intend to get married in their lives (subjects who are younger than 35 years of age only for the 8th and 9th surveys). The percentages are obtained from respondents whose ideal/desired number of children is one or more, excluding subjects who are uncertain about ideal/desired number of children.

When the percentage of people having/not having ideals or desires for combinations of children's sexes are compared for wives by the ideal number of children, and for never-married men and women by the desired number of children, it was found that there are large gaps in both cases. Since the time-series tendencies are roughly identical, only the results of the 13th survey (2005) are shown in Figure 3.

According to Figure 3, more than half of the respondents whose ideal/desired number of children is one child do not have any particular sex preferences for children, except for never-married women. In case of subjects whose ideal/desired number of children is two, three, or four children, however, those who have certain ideals or desires for sex combinations account for the majority. In case the number of children is an even number, responses that indicate preferences for same number of sons and daughters are possible and the percentage of subjects having certain ideals/desires for sex combinations thus tends to increase. In particular, 80% of both wives and never-married people whose ideal/desired number of children is four children responded that they have certain ideals/desires for sex combinations (the majority answered two sons and two daughters).

Figure 3 Percentages of Respondents Having/Not Having Ideals/Desires for Combinations of Children's Sexes by Marital Status/Having or Not Having Children (Wives with/without Children and Never-married Men/Women) and the Ideal/Desired Number of Children: 13th Survey (2005)



Note: Same as for Figure 2

It is speculated that the percentage of respondents who have certain ideals/desires for sex combinations increases in case of respondents wishing to have multiple children because a tendency toward balance preference, where subjects wish to have at least one son and daughter, respectively, is in play. It seems that subjects whose ideal/desired number of children is an even number tend to indicate equal numbers of sons and daughters. In case of respondents whose ideal/desired number of children is an odd number, they answer the question considering which, sons or daughters, they want to have more.

(2) Development of Sex Preferences by the Ideal/Desired Number of Children

Next, we look at what specific wishes the respondents have for the sex combinations of their children. Here, the data is examined for each ideal/desired number of children, but the targets of the analysis are limited to those who responded that they had certain "ideals/desires" for the sex combination of their children.

Figure 4 shows a breakdown of the preferred sexes for children of respondents whose ideal/desired number of children is one, for four groups of respondents: wives with children, wives without children, never-married men and never-married women, by survey year. As a general trend from the eighth survey (1982) to the 13th survey (2005), the percentage of respondents stating that they preferred sons decreased while the percentage of respondents stating that they preferred daughters rose. Looking at the data of wives, the percentage of wives without children wishing for daughters was as high as 68% as of the eighth survey (1982) and it continued to rise in the following years as well and reached 79% in the 13th survey (2005). Among wives with children, 58% wished for sons in the eighth survey, but they were equally divided between sons and daughters in the ninth survey. Thereafter, approximately 70% of them preferred daughters. On the other hand, the percentage of never-married women selecting sons is higher than among wives, but more than half of the never-married women selected daughters in the tenth survey and onward. Among never-married men as well, the percentage of subjects selecting daughters is increasing; 80% of the never-married men stated that they would prefer sons in the eighth survey, but by the time of the 13th survey, those who preferred daughters accounted for an equal percentage.

Figure 4 Sex Preferences by Marital Status/Having or Not Having Children (Wives with/without Children and Never-married Men/Women) by Survey Year: One ideas/desired number of children

Note: Data on wives less than 50 years of age of first-married couples, and never-married men and women who intend to get married in their lives. The percentages are obtained from respondents whose ideal/desired number of children is one or more and who have ideals/desires for sex combinations of children, excluding respondents who are uncertain about the ideals/desires for sex combinations of children.

Among the respondents whose ideal/desired number of children is two, the percentage of balance preference, i.e., one son and one daughter, accounted for 80 to 90% and very few selected the combinations of either two sons or two daughters. Since the trends are difficult to represent graphically, the breakdown is shown in Table 1.

"Two children" is the most frequently selected category among the responses on the ideal/desired number of children. Since 80 to 90% of the respondents belonging to the group have the balance preference of one son and one daughter, the balance preference necessarily accounts for the highest percentage in the overall sex preferences as well.

Looking at the trends of respondents choosing two sons or two daughters, the percentage of wives with children choosing two daughters is slightly higher (around 10%) compared to other groups. This trend is not seen among other categories of women, i.e., wives without children and never-married women, indicating that wives with children have more daughter preference than other women.

Table 1 Sex Preferences by Marital Status/Having or Not Having Children (Wives with/without Children and Never-married Men/Women) by Survey Year: Two ideal/desired number of children

Status	Survey Year	2 sons, 0 daughter	1 son, 1 daughter	0 son, 2 daughters
Wives with children	8th(1982)	9.7	81.1	9.2
	9th(1987)	4.7	84.7	10.6
	10th(1992)	3.4	83.2	13.5
	11th(1997)	2.2	83.4	14.3
	12th(2002)	2.2	83.6	14.2
	13th(2005)	2.6	84.1	13.3
Wives without children	8th(1982)	3.1	90.2	6.7
	9th(1987)	0.9	92.0	7.1
	10th(1992)	0.6	88.1	11.4
	11th(1997)	1.9	91.2	7.0
	12th(2002)	0.9	93.2	5.9
	13th(2005)	0.7	94.3	5.0
Never married women	8th(1982)	1.3	94.0	4.6
	9th(1987)	2.9	91.4	5.8
	10th(1992)	3.8	90.6	5.6
	11th(1997)	1.9	89.8	8.2
	12th(2002)	1.6	90.3	8.1
	13th(2005)	1.5	91.2	7.3
Never married men	8th(1982)	7.9	91.0	1.1
	9th(1987)	5.7	92.9	1.4
	10th(1992)	6.3	91.9	1.9
	11th(1997)	5.0	92.0	3.0
	12th(2002)	4.2	92.9	2.9
	13th(2005)	4.3	93.1	2.6

Note: Same as Figure 4

Figure 5 shows the statistics corresponding to the case where the ideal/desired number of children is 3, which is the second most frequently chosen option after the "two children" option analyzed above. Looking at the graphs, only very few subjects preferred either sons or daughters only; the majority selected either "two sons and 1 daughter" or "one son and two daughters." In other words, most respondents wish to have both sons and daughters, and those preferring the same sex for all three children are exceptions.

Here as well, it can be observed that since the 1980s toward the 1990s, more and more people indicate daughter preference in the combination of "one son and two daughters." In other words, over the last 20 years, there is a gradual trend toward a weakening of the son preference in the preferred sex combination for three children as well. Although those having daughter preference still have not surpassed those with son preference, as shown by 50 to 60% of the respondents other than wives with children selecting the combination with more sons (two sons and one daughter) during the 13th survey (2005), it is safe to say that son preference and daughter preference are becoming almost equal in this category. Exceptionally, the majority of the wives with children selected the combination with more daughters from the tenth survey (1992) and onward, indicating a strong trend toward daughter preference. Moreover, men

indicate a tendency toward selecting son preferential combinations, but the percentage is declining over the years, albeit very slowly.

Figure 5 Sex Preferences by Marital Status/Having or Not Having Children (Wives with/without Children and Never-married Men/Women) by Survey Year: Three ideal/desired number of children

Note: Same as Figure 4

(3) Sex Preferences and Reasons to Have Children

Now, let us examine if the reasons for having children have any relation to the basis of sex preferences. The married couple survey asked wives who had stated that their ideal number of children is one or more about their reasons to have children. Table 2 shows the ratios of selecting reasons of having children by the ideal number of children and the combinations of sons and daughters. As a general trend, the larger the ideal number of children, the higher the ratio of selecting each item; indicating that respondents acknowledge great values in children. In addition, certain differences are seen in the ratios of selections by the ideal combination of sons and daughters as discussed below.

The ratio of selecting “Children make our lives more enjoyable and richer,” ”Children stabilize marital relationship,” and “Children will support us in old age,” which are the most frequently chosen reasons of having children, is higher among respondents preferring one or more daughters. The ratio of selecting “Wish to have children of beloved person” is high among those who prefer to have at least one son, probably largely because the respondents are wives. “Children will support future

society" is also selected by many respondents who wish to have more sons than daughters.

On the other hand, for the reasons "It is natural to get married and have children" and "Husbands, parents, and other people around me wish for children," no clear differences were observed by sex combination of children. Wives whose ideal is to have one son selected "People will think more highly of me if I have children" particularly often.

Table 2 Ratios of Selecting Reasons for Having Children by Ideal Number of Children and Sex Combination: 13th Survey (2005)

Ideal number of children	Ideal combination of sons and daughters	Number of samples	Children make our lives more enjoyable and richer	It is natural to get married and have children	Wish to have children of beloved person	Children stabilize marital relationship	Children will support future society	Children will support us in old age	Husbands, parents, and other people around me wish for children	People will think more highly of me if I have children
One child	1 son, 0 daughter	(16)	56.3	31.3	25.0	18.8	18.8	25.0	6.3	31.3
	0 son, 1 daughter	(54)	64.8	46.3	29.6	25.9	9.3	18.5	11.1	5.6
Two children	2 sons, 0 daughter	(34)	64.7	55.9	23.5	11.8	20.6	5.9	8.8	0.0
	1 son, 1 daughter	(1,368)	74.1	59.4	38.2	27.4	18.1	20.8	16.7	7.2
	0 son, 2 daughters	(190)	73.2	52.6	24.2	27.4	18.4	16.3	11.6	7.4
Three children	3 sons, 0 daughter	(13)	84.6	23.1	15.4	7.7	30.8	7.7	7.7	0.0
	2 sons, 1 daughter	(506)	85.2	63.0	43.1	33.6	23.7	20.0	13.2	5.7
	1 son, 2 daughters	(766)	86.6	58.1	35.8	30.8	27.0	26.6	11.7	6.3
	0 son, 3 daughters	(28)	89.3	57.1	10.7	28.6	21.4	35.7	14.3	7.1
Four children		(273)	87.9	57.9	37.4	29.3	30.0	22.0	8.8	5.5
Five or more		(41)	82.9	63.4	19.5	22.0	22.0	22.0	7.3	7.3
No ideal combination		(1,803)	77.8	61.0	31.6	24.1	20.6	14.0	11.4	5.2
Total		**(5,188)**	**78.8**	**59.6**	**34.7**	**27.1**	**21.5**	**18.9**	**12.8**	**6.1**

Note: Data on wives less than 50 years of age of first-married couples. Respondents whose ideal number of children is 0 and respondents who are uncertain about the ideal number of children, whether or not they have any ideal combinations of sons and daughters, and specific ideal combination of sons and daughters, are excluded.

This data shows that parents (specifically wives) expect their sons and daughters to fulfill different roles. As households become more affluent due to the economic development, the recognition of economical values of children (roles of workers and heirs) is declining in Japan, whereas the psychological values grow in importance. It seems that the parents view daughters as being more strongly connected with these psychological values. Moreover, as Japan is turning into a longevity society and issues

of nursing care of elderly are becoming increasingly important, the emerging daughter preference also seems to be linked to the role of support in old ages, presumably because the subjects can expect more care-taking support from daughters than from sons. These background factors are believed to be reasons for the development toward daughter preference observed in Japan over the last 20 years.

So far this paper has observed the development of sex preferences in Japan in the 1980s and onward based on the results of cross tabulation. Many people have ideal or desired combination of sex for children, indicating that their interest in the sex composition of their children is high. Moreover, the majority wants to have combinations with at least one son and at least one daughter; people wishing only either sons or daughter comprise a very small minority. Thus, it can be said that the balance preference is widespread in Japan.

In case the ideal/desired number of children is two children, the respondents selecting the balance preference of one son and one daughter account for 80 to 90%, but in case the number is an odd number, such as one or three, it was recognized that sex preferences are shifting from son preference in the 1980s to daughter preference in the 1990s and onward. It is speculated that this is because values typically associated with daughters are evaluated highly recently, as seen in the analysis here.

Moreover, wives who already have children showed a strong daughter preference. Their strong wishes to have daughters indicate that the sex composition of existing children influences whether or not to want additional children. Next, let us examine if sex preferences for children influences fertility intention.

III. Sex Preferences for Children and Fertility Intention: Empirical Analysis

1. Data and Methods

For the multivariate analysis on fertility intention and sex preferences, micro data of the 13th married couple survey is used. Analysis method is logistic regression with binary data on fertility intention as dependant variable: “no intention to have (more) children” is set to 0 and “intend to have X (more) children” (four categories of one to four children) is set to 1. This model analyzes what factors influence their intentions to have the second or third child, respectively.

Bulatao (1981) stated that there are two stages in family formation; married couples have early childbearing mainly because of normative forces and social constrains, and later childbearing based on a more socioeconomic rational calculation of the parents. Since the causes of motivation to have children are considered different for each parity, the samples used hire were limited to wives who currently have one or two children.

This analysis used the sample of first-married couples. The ages of wives are 20 to 39 years of age and wives who were pregnant at the time of the survey were excluded. As explanatory variables of fertility intention, the sex of the first child (in analysis of fertility intention for the second child) and sex composition of the first and second children (in analysis of fertility intention for the third child) were employed as the major variables regarding sex preferences. In the analysis of fertility intention for the second child, a dummy variable where the first child is a son were used to verify if the fertility intention is different compared to the case where the first child is a daughter. In the analysis of fertility intention for the third child, the combination of one son and one daughter is used as the reference to verify if composition of the same sex, i.e., two sons or two daughters, has significant effect on fertility intention for the third child.

Additionally, in order to see the effects of sex preferences more clearly, the following control variables are employed: wife's current age and age at birth of the first child as demographic factors, educational attainment of wives, employment status of wives, residence status of mother of wife/husband, working hours per week and monthly earning of husbands, and residence in DID (densely-inhabited district) as the socioeconomic factors. The descriptive statistics of the variables used for the analysis are listed in Tables 3 and 4.

Table 3 Analysis of Fertility Intention for the Second Child: Descriptive Statistics

Variables	Frequency	Minimum Value	Maximum Value	Average Value	Standard Deviation
Intention to have additional children (none=0)	803	0	1	0.677	0.468
First child is a son (daughter=0)	716	0	1	0.503	0.500
Current age of wife (years old)	833	20	39	31.798	4.446
Age of wife at birth of the first child (years old)	805	17	39	28.048	4.003
Wife's education: Junior high school	823	0	1	0.030	0.172
Wife's education: Senior high school	823	0	1	0.358	0.480
Wife's education: Junior or technical college	823	0	1	0.402	0.491
Wife's education: University or higher	823	0	1	0.209	0.407
Employment status of wife: Unemployed	812	0	1	0.559	0.497
Employment status of wife: Full time	812	0	1	0.159	0.366
Employment status of wife: Part-time	812	0	1	0.228	0.420
Employment status of wife: Self-employed, Family worker	812	0	1	0.054	0.227
Residence status of mother of wife (lives separate=0)	741	0	1	0.935	0.246
Residence status of mother of husband (lives separate=0)	753	0	1	0.857	0.351
Working hours per week of husband (hours)	754	0	112	51.497	15.110
Monghly earning of husband (\10,000)	745	0	100	32.783	15.924
Residence in DID (not DID=0)	833	0	1	0.678	0.467

Note: Samples are wives, aged 20 to 39 years old, of first-married couples and currently have one child.

Table 4 Analysis of Fertility Intention for the Third Child: Descriptive Statistics

Variables	Frequency	Minimum Value	Maximum Value	Average Value	Standard Deviation
Intention to have additional children (none=0)	1,259	0	1	0.122	0.327
One son and one daughter	1,026	0	1	0.509	0.500
Two sons	1,026	0	1	0.266	0.442
Two daughters	1,026	0	1	0.225	0.418
Current age of wife (years old)	1,282	22	39	33.956	3.797
Age of wife at birth of the first child (years old)	1,247	17	37	26.204	3.170
Wife's education: Junior high school	1,276	0	1	0.030	0.170
Wife's education: Senior high school	1,276	0	1	0.451	0.498
Wife's education: Junior or technical college	1,276	0	1	0.396	0.489
Wife's education: University or higher	1,276	0	1	0.123	0.329
Employment status of wife: Unemployed	1,254	0	1	0.487	0.500
Employment status of wife: Full time	1,254	0	1	0.148	0.355
Employment status of wife: Part-time	1,254	0	1	0.301	0.459
Employment status of wife: Self-employed, Family worker	1,254	0	1	0.064	0.244
Residence status of mother of wife (lives separate=0)	1,137	0	1	0.927	0.260
Residence status of mother of husband (lives separate=0)	1,149	0	1	0.802	0.398
Working hours per week of husband (hours)	1,138	0	102	51.070	14.061
Monghly earning of husband (\10,000)	1,123	0	196	36.788	18.097
Residence in DID (not DID=0)	1,282	0	1	0.612	0.488

Note: Samples are wives, aged 20 to 39 years old, of first-married couples and currently have two children.

Note that the dependent variable here is “fertility intention,” which is not the same as actual fertility. Numerous studies have been conducted on the frequency of realization of fertility intentions and the pros and cons have been debated in various previous studies (Westoff and Ryder 1977; Freedman et al. 1980; Schoen et al. 1999; Moriizumi 2004, etc.). There are many cases where the finally actualized number of parities of individuals is larger or smaller than the intended number of children expressed beforehand. Nonetheless, it is pointed out that fertility intention is an important factor when predicting future fertility behaviors.

2. Results of Analysis

Table 5 shows the results of logistic regression analysis on fertility intentions for the second and third children.

First, the analysis of fertility intention for the second child indicated significant results concerning the effects of the sexes of children. If the first child is a son, the fertility intention is higher than the case where the first child is a daughter. Looking at the marginal effect, if the first child is a son, the probability of wanting to have a second child is 10% higher compared to the case where the first child is a daughter.

The following results were indicated from other variables. The older the wife, the lower the fertility intention for the second child. The older the wife at birth of the first child, the higher the probability of wanting additional children. Looking at the

socioeconomic variables, the probability of wanting a second child is higher in case of wives who are self-employed/family workers, compared to cases of unemployed wives. As for the residence status of mothers, wives living together with or close to their own mothers intend to have a second child more often than wives living separately from their mothers. Wives living together with or close to their husbands' mothers intend to have a second child less often than wives living separately[3]. Residence in DID significantly lowers the probability of intending to have a second child compared to people living in non-DID.

Next, the analysis of fertility intention for the third child indicated a significant influence of the sex composition of children, in the same way as in the analysis of fertility intention for the second child. It was found that the sex composition of existing children has the effect of increasing the fertility intention for the third child when both the children are sons, compared to the case of one son and one daughter. The coefficient is not significant in case of two daughters.

In the analysis of fertility intention for the third child, the other variables are found to have the following effects. Although the marginal effect values are low for the current age and age at birth of first child of wives, similar results as the result of fertility intention for the second child can be observed. As for the socioeconomic variables, the probabilities of wanting a third child were significantly higher in cases where wives are working full time or self-employed/family workers, compared to unemployed wives. It is inferred that wives with two children and working full time are living in privileged child-rearing environments and thus tend to have higher fertility intention. Moreover, self-employed/family workers wives tend to have high fertility intention from the outset (Moriizumi 2007) and they may easily find values of children as “heirs” and “family workers.”

From the result of the logistic regression analysis above, it was found that the sex compositions of existing children have significant effects on fertility intentions for both the second and third children and are one of the determinants of fertility intention. Moreover, the fertility intention for additional children is significantly high in case of married couples who have only sons.

In the analysis in Section 2, it was pointed out that the most widespread pattern in Japan is balance preference where people wish to have at least one son and one daughter, and a general trend toward increased daughter preference is observed in recent 20 years when the number of children is an odd number. Considering these facts, it is speculated from the analysis results above, which suggest people’s preferences toward having daughters have the effect of encouraging additional births, that a particular type of balance preference, where a priority is placed on having daughters,

[3] Although it is difficult to interpret the effects of mothers on the husband side, married couples tend to have less help from mothers on the wife side if they live together with or close to mothers on the husband side (see Appendix Table 2). For this reason, living together with or close to mothers on the husband side may in fact work in the direction of lowering the fertility intention.

is favored. In other words, sex compositions of children influence fertility intention, but couples who already have daughters tend to prioritize their wish for the number of children and are thus less likely to wish to have additional children. On the other hand, couples who have sons only strongly wish to have daughters and are thus more likely to want additional children.

Table 5 Logistic Regression Model of Fertility Intention for the Second and Third Children

Variables	Fertility intention for the second child		Fertility intention for the third child	
	Coefficient	Marginal effect	Coefficient	Marginal effect
Sex compositions of children				
First child is a son (1 son and 1 daughter)	0.5326 *	0.10318	—	
2 sons and 0 daughter	—		0.7214 **	0.06553
0 son and 2 daughters	—		-0.2380	-0.01769
Demographic variables				
Age of wife	-0.4119 **	-0.07989	-0.3239 **	-0.02539
Age of wife at birth of the first child	0.3264 **	0.06331	0.2338 **	0.01833
Socioeconomic variables				
(Education of wife: Junior high school)				
Senior high school	-1.6457	-0.34133	0.2496	0.01979
junior or technical college	-1.0546	-0.21214	-0.0588	-0.00459
University or higher	-1.0311	-0.22319	0.0396	0.00314
(Employment status of wife: Unemployed)				
Full time	0.4784	0.08540	0.9760 **	0.10220
Part-time	-0.0957	-0.01879	0.1546	0.01244
Self-employed, family worker	1.4372 *	0.19459	0.8879 +	0.09578
Coresidence with mother of wife	0.8728 +	0.19454	-0.1384	-0.01140
Coresidence with mother of husband	-0.7432 +	-0.12546	-0.4175	-0.03641
Working hours per week of husband	-0.0131	-0.00254	-0.0095	-0.00075
Monghly earning of husband	0.0038	0.00073	-0.0043	-0.00034
Residence in DID	-0.5140 +	-0.09519	0.2405	0.01846
Constant	6.5218 **		2.9847 *	
Chi-Square	9.468		6.600	
Cox & Snell R square	0.281		0.122	
Number of samples	513		704	

Note: The subjects are wives of first-married couples, aged 20 to 39 years old.

The significant level is **< 0.01, * < 0.05, + < 0.1.

IV. Summary and Discussion

In this paper, using the data of the eighth (1982) to 13th (2005) Japanese National Fertility Survey (Married Couple Survey and Single Survey), author conducted analyses for the purpose of investigating the development of sex preferences in Japan and the causes as well as the relationship between sex preferences and fertility intentions. From the results of the cross tabulations documenting the development of sex preferences in the first part of the study, it was found that people's interest in sex compositions of children is high in Japan and the majority chose combinations that

include at least one son and daughter each. Moreover, in cases the ideal number of children (of wives) and the desired number of children (of never-married men and women) are even numbers, more than 90% of the respondents exhibit balance preference (same number of sons and daughters). If the numbers are odd, however, it was revealed that preferences have changed from combinations with more sons to combinations with more daughters over the last 20 years. Wives with children, in particular, indicated strong tendencies toward daughter preference.

In order to explore the causes of this trend, the relationship between combinations of sex of children and reasons for having children were analyzed. It was found that parents expect their sons and daughters to fulfill different roles, and daughters are more closely associated with the items selected by many respondents as the reasons for having children. This is speculated to be the reason that the trend toward daughter preference has been continuing in Japan in the past 20 years. The wives who chose combinations with more daughters tend to select the item “support in old ages” as a reason to have children more often than other respondents. This is considered to be a manifestation of the fact that high values are attached to daughters from whom more support in the form of nursing care can be expected, in the growing concerns about the problem of nursing care of elderly. As the aging of society advances, this may serve as an engine driving the movement toward daughter preference in the future as well, as far as the traditional view on gender roles that assumes that nursing care is handled by daughters persists.

Moreover, a logistic regression analysis has conducted in order to identify how the sex compositions of existing children influence the intention to give birth to additional children. The results suggested that the sex compositions of existing children have significant influence on both the fertility intention for the second and third children. If the first child is a son or both the first and second children are sons, the probabilities of wanting another child are significantly higher. From these results, it is possible to assume that the balance preference, i.e., wish to have both a son and a daughter, is strong in Japan, but a particular form of balance preference where couples wish to have daughters more than sons has been building up in Japan. The results also indicated that other significant variables were the current age of wives, age of wives at birth of the first child, residence status of mothers of wives and husbands, residence in DID, and employment status of wives.

From the analysis results outlined above, it is considered that the following changes are occurring in the sex preferences in Japan amid the advancement of the modernization of the society and economy: (1) the former clear son preference is disappearing gradually; (2) a balance preference for having at least one son and daughter each (in particular, one each for son and daughter, two children in total) is dominant; (3) preferences for having combinations with more daughters are becoming stronger among people wishing to have an odd number of children; and (4) fertility

intentions for the next child are higher among married couples who have only sons than couples who have only daughters, which means that sex preferences where having daughters is regarded important have become prevalent.

Lastly, it is considered that the trend of sex preferences will become important in terms of development of reproductive technologies that show prominent advancement recently. For example, so-called preimplantation genetic diagnosis is now an established technology. By applying this technology to sex-choice birth, it is possible to become pregnant with a child with preferred sex with the highest reliability. Japan and many other developed countries prohibit performing preimplantation genetic diagnosis for the purpose of sex-choice birth, but the USA, for example, does not regulate its use, which means that it is possible to select sexes via preimplantation genetic diagnosis as long as a physician deems it feasible.

Although the interest in sexes of children is high, practices of sex-choice birth by means other than preimplantation genetic diagnosis are far from popular at least in Japan currently. However, the fact that sex selection is technically possible means that in the future people will not only be able to control the number of children by contraception, but also control the sex composition. Even if sex selection becomes widespread, it is not possible to state the impact on fertility indiscriminately because both positive (people wish for a third child if sex selection is possible) and negative (the effect of having additional children in order to have children of preferred sexes is lost) effects on fertility behaviors for additional children can be considered. However, from the current conditions of sex preferences in Japan, it seems likely that the sex ratio at birth may become higher for daughters, which may be a cause for concern.

According to the social trend, the son and daughter preferences are changing slowly, and thus the changes influence fertility behaviors significantly. It is considered important to continue to observe the development of sex preferences for children, along with the aspect of the development of reproductive technologies.

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Appendix Table 1 Percentage of Respondents whose Ideal/Desired Number of Children is 0 and Number of Samples by Survey Year

Survey Year	Wives without children		Wives with children		Never married women		Never married men	
	%	(N)	%	(N)	%	(N)	%	(N)
8th(1982)	10.9	(77)	0.6	(44)	3.8	(75)	2.3	(60)
9th(1987)	8.9	(53)	0.5	(40)	3.3	(80)	2.5	(77)
10th(1992)	10.1	(87)	0.5	(34)	5.3	(184)	3.1	(131)
11th(1997)	11.8	(82)	0.4	(24)	6.3	(216)	3.6	(139)
12th(2002)	8.9	(73)	0.5	(30)	7.3	(244)	5.5	(218)
13th(2005)	16.4	(112)	0.6	(31)	6.8	(209)	5.2	(173)

Note: Percentages including subjects who are uncertain about the ideal/desired number of children

Appendix Table 2 Frequency of Childbearing Support for the First Child by Residence Status of Mothers on the Wife/Husband: 13th Survey (2005)

Combination of residence status	Number of samples	Percentage(%)	
		Wife's mother	husband's mother
Coresidence with wife's mother/ Proximate residence with husband's mother	(65)	69.2	13.8
Coresidence with wife's mother/	(115)	72.2	7.0
Proximate residence with wife's mother/	(508)	52.2	5.9
Proximate residence with wife's mother/	(266)	30.5	66.5
Separately from wife's mother/	(476)	22.7	60.1
Separately from wife's mother/	(620)	22.3	25.3
Proximate residence with both mother	(694)	47.4	22.6
Living separately from both mother	(1,626)	25.8	8.5
Coresidence with both mother	(98)	33.7	41.8
Other combinations	(273)	21.2	15.0
Both mothers are dead	(6)	—	—
Uncertain combinations	(370)	25.9	28.9
Total	(5,117)	32.4	22.5

Note: The subjects are first-married couples. Percentages are the sum of “daily” and “frequently.”

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