

With prevailing daughter preference, I investigate whether prevailing daughter preference in Japan has implications for fertility behavior. Specifically, I explore whether gender *preference* influences future fertility *behavior* among Japanese couples with one child, including whether and when they go on to have another child. At the same time, I also consider an alternative explanation for couples' parity progression, that is, whether perceived parenting difficulty of the first-born affects subsequent fertility.

Gender preference hypothesis

Past research, mostly those of developing countries with strong son preference, has found that gender preference can affect reproductive behavior. Specifically, they reveal that having a child of the desired gender is associated with a lower probability of a subsequent birth as well as a longer birth interval if they choose to have an additional child (e.g. Larsen et al., 1998). A related phenomenon is found in India, a country with persistent son preference, in that breastfeeding duration is shortest for daughters and children without older brothers so parents can become pregnant again (Jayachandran and Kuziemko 2011). Even in Germany, son preference is found to affect behavior in that parents with a first-born son are significantly less likely to have another child than parents of a first-born daughter (Choi, Joesch and Lundberg 2008).

As described earlier, daughter preference has become common among Japanese couples today. Given the relationship between gender preference and subsequent fertility in other countries with sound gender preference, could Japanese parents with a first-born son be more likely to have a second child and have one sooner than those with a first-born daughter? In this paper, I examine this possibility.

In fact, a recent study examining Japanese couples' sex compositions of existing

children and their intentions to have another child found that those whose first child was a son or first two children were sons were more inclined to intend to have another child, suggesting a desire for a daughter (Moriizumi 2008). What is unknown is whether such intentions in fact affect future fertility behavior in Japan, hence merits investigation.

Parenting difficulty hypothesis

Previous research shows that having a first child with socioemotional and behavioral traits that make parenting easier is associated with a second birth (e.g. Jokela 2010). For example, analyzing families from the British Millennium Cohort Study, Jokela (2010) has found that families with first-borns who had low reactivity to novelty in infancy, high prosociality, low conduct problems and high cognitive ability around age 3 had increased probability of having a second child. Therefore, in this study, I investigate whether parents who experience difficulty in parenting their first child hesitate to have an additional child while parents who have less difficulty go on to have another child.

Parenting difficulty may be related to the gender of the child. It is commonly known that male infants are more difficult to raise than females because they are more prone to illness and injuries. Since males are biologically more vulnerable than females, males typically have higher infant and child mortality (Waldron 1983). Indeed, the sex ratio of infant mortality is 103.6 in 2010 in Japan (Ministry of Health, Labour and Welfare 2012) suggesting that Japanese males are more vulnerable at infancy. Moreover, boys are more likely to be born prematurely, and male preterm infants have greater mortality and morbidity than females (Peacock et al. 2012).

In addition, boys are considered more physically active and require parental attention. According to the Tokyo Fire Department's data, the number of unintentional injuries that

occurred between 2006 and 2010 in Tokyo was higher among 1-year olds than among any other age groups. Boys compared to girls represented a higher percentage of those unintentional injuries among 0 to 5 years old (Tokyo Fire Department 2012). According to a study of infants' nighttime sleep awakenings, boys compared to girls were more likely to be "transitional sleepers"² than "sleepers"³, indicating that boys tend to be more difficult during nighttime as well (Weinraub et al. 2012).

Taken together, boys appear to be more difficult to raise than girls. If parents' difficult experiences with the first child affects their desire and timing to have another child, could parents with a boy as their first child may rather be less likely to transition to a second birth or postpone having another child? This possibility is also explored.

Data and Methods

I use the Japanese Longitudinal Survey of Newborns in the 21st Century to examine the above hypotheses. The Longitudinal Survey of Newborns in the 21st Century, a nationally representative survey of newborns born in 2001, was launched in 2001 and has since followed all newborns born between January 10th and 17th, and between July 10th and 17th. These newborns were identified from vital registration forms (Live Birth Forms) that contribute to the national vital statistics. Target newborns were first surveyed on August 1, 2001 (newborns born in January) or February 1, 2002 (newborns born in July) via mail when they were 6 months old and have been surveyed on an annual basis (i.e. when the subjects were 1 and a half years old, 2 and a half years old, etc) till the 6th survey when the subjects were 5 and a half years old. The 7th

² This represents a group in which mothers report their infant awakening from sleep about 7 nights per week at 6 months, dropping to 2 nights per week at 15 months and to 1 night per week by 24 months.

³ This represents a group in which mothers report their infant awakening from sleep about 1 night per week from 6 to 36 months.

survey was conducted on July 18th, 2008 when the subjects were all 7 year olds; the survey has since been conducted annually on July 18th for all subjects. The survey covers topics such as parenting practices, perceived parenting burden, child development, parents' background, etc.

In the present study, since I am interested in examining Japanese parents' process of having a second child, my analysis will be based on those who were first-born children in the first survey (twins, triplets, and newborns who had brothers or sisters at the time of the first survey were excluded). If a second birth were to occur rather intentionally, it is natural to expect that it will occur within 5 years from the first birth. Thus, I follow data up until the 6th survey when the survey subjects were 5 and a half years old to see whether and when a younger sibling has been added to the family.⁴ I exclude those who welcomed a brother or a sister at an unordinary timing (i.e. within 7 months of the birth of the survey subject) since it can be speculated that the new addition is a step brother or sister.⁵ For the same reason, I also exclude cases who welcomed a brother or sister that is not a newborn.

Additionally, I limit the sample to those whose parents are living together at the time of the first and second survey. Lastly, those who were born outside Japan and those whose parents are both foreigners (i.e. not Japanese citizens) are excluded from analysis. This yielded 20,413 cases to be analyzed.

Dependent Variable

To examine parity progression to a second birth, the dependent variable is months to the second

⁴ Due to the survey design, one cannot distinguish whether the new addition to the family is a full sibling to the survey subject. In the first survey, the survey asked for the number of brothers and sisters living with the survey subject at the time of the survey, and for their birthdates if any. In the second through the sixth survey, the survey merely asked whether there were any additions (brothers or sisters) to the family since the previous survey, and for their birthdates if any.

⁵ I consider any addition after 7 months a sibling. The reason why I use "7 months" as the cut-off line is because it is possible that the subsequent child, conceived right after the birth of the first child, was born prematurely. There were two such cases in which a second child was born 7 months after the birth of the first child.

birth from the first birth. Duration ranged from 7 to 67 months. Observations were right-censored at 67 months if a second birth did not occur by then.

Independent Variables

My main independent variable is gender of the first-born child. Each case comes with a series of basic birth information from the birth registration form. Sex is one of them.

My other main independent variable is parenting difficulty of the first-born. Here, I distinguish between two types of parenting: subjective parenting difficulty and objective parenting difficulty. Subjective parenting difficulty variables are to measure parents' subjective assessment of their parenting difficulty arising from parenting concerns and physical parenting burden. Objective parenting difficulty variables are to measure parenting difficulty arising from the child's illnesses and injuries.

I use several questions from the first and second survey to capture subjective parenting difficulty. The first and second surveys include the question, "How concerned are you about raising your child?" Response options ranged from 1=very concerned, 2=somewhat concerned, and 3=not very concerned. I treat "not very concerned" as the reference category. The survey also includes the following question to assess whether the following items are perceived as a burden to the parent:

"In raising your child born in 2001, do you consider the following a burden?"⁶

1. Physical exhaustion from parenting (first and second surveys)
2. Child needs close supervision/can't take eyes off the child (second survey only)
3. Child gets sick often (first and second surveys)

⁶ Other items included in the survey (not analyzed) are "Financial costs associated with raising the child," "Don't have any free time to myself," "Don't have any free time to spend with my husband/wife," and "Can't concentrate on my work."

Respondents selected items they considered a burden. The first two items are treated as measures of subjective parenting difficulty and the third item is treated as a measure of objective parenting difficulty.

In the second survey (conducted when the child was 18 months old), the questionnaire provides a list of common illnesses and injuries (ranging from cut and bruises to congenital diseases to various infectious diseases)⁷ and asks whether the child has stayed in the hospital in the past one year due to one or more of those illnesses or injuries. The questionnaire also has a list of accidents/injuries and the respondents indicated whether the child has experienced them in the past year. The accident/injury list covers light injuries (e.g. accidentally cut himself/herself with a sharp object, bit by an animal/stung by a bee) and heavy ones (e.g. car accident, drowned). If the child has experienced one or more of these accidents/injuries, s/he is coded as 1, otherwise coded as 0.

Control variables

I control for several background variables that affect fertility including mother's age at childbirth, mother's tobacco use, and mother's employment status. Mother's age at childbirth is measured in years and tobacco use is dummy coded where 1=current smoker and 0=current non-smoker. I create five categories for mother's education: junior high school graduate, high school graduate (reference), vocational school graduate, junior college graduate, and college graduate or above. I create a variable for mother's employment status at the time of the first survey: unemployed/students (reference), full-time employees who are currently on

⁷ List of illnesses includes: chickenpox, whooping cough, German measles, measles, roseola infantum, conjunctivitis, ear infection, bronchitis/pneumonia, asthma, diarrhea/constipation, impetigo, allergic dermatitis, other eczema, congenital disease, convulsions, food allergies, other diseases, cut and bruises, fractures, burn injury, other injuries.

maternal leave (or have already been on or expecting to be on maternal leave), full-time employees who do did not take and do not plan on taking a maternal leave), part-time employees, and self-employed. I also control for a variable indicating whether the child's grandmother was co-residing at the time of the first survey.

Analysis

First, I present descriptive statistics of the variables used in the study. Then, I show bivariate associations between gender of the first-born child, measures of parenting difficulty and second birth (i.e. percentage having a second child, duration to second birth among those who had a second birth). I also show the relationship between gender of the first-born child and measures of parenting difficulty. Finally, data are analyzed using discrete-time event history analysis. Specifically, I estimate the complementary log-log (cloglog) model to person-month data on transition to a second birth. The original data were converted into a monthly person-period file. Analysis time spanned from 7 months to 67 months from the birth of the first child and cases were right-censored at 67 months if birth of a second birth did not occur by then.

Results

Table 2 presents descriptive statistics of all variables used in the analysis. Of the 20,413 first-borns, 51.23% were boys and 48.77% were girls. 64.95% of them had a little brother or sister by the 6th survey. Of those who had a younger sibling, the average number of months it took to welcome a sibling was 33.52 months from their birthday. About two-thirds of parents had at least some concern about raising their first-borns when they were 6 months and 18 months old. More than a third of parents also claimed physical exhaustion associated with parenting their 6-month olds and 18- month olds. Not very many parents reported that their

first-borns get sick often but about 10% of the children have been hospitalized and 78% of them have experienced some kind of accident or injury.

Table 2: Descriptive Statistics of the Variables in the Analysis		
Variable		n = 20,413
Sex of the first-born child		
Boy		51.23
Girl		48.77
Had a second child before the 6th survey		
No		35.05
Yes		64.95
(If yes) Average number of months to second child ^a		33.52 (12.56)
<i>Subjective parenting difficulty of the first child</i>		
(1st survey) Concerned about raising your child		
Very concerned		6.54
Somewhat concerned		58.60
Not very concerned		34.86
(2nd survey) Concerned about raising your child		
Very concerned		5.79
Somewhat concerned		58.66
Not very concerned		35.55
(1st survey) Physical exhaustion from parenting		
Not selected		62.18
Selected		37.82
(2nd survey) Physical exhaustion from parenting		
Not selected		62.40
Selected		37.60
(2nd survey) Child needs close supervision/can't take eyes off the child		
Not selected		66.10
Selected		33.90
<i>Objective parenting difficulty of the first child</i>		
(1st survey) Child gets sick often		
Not selected		98.31
Selected		1.69
(2nd survey) Child gets sick often		
Not selected		95.40
Selected		4.60
(2nd survey) Hospitalization		
Not selected		89.18
Selected		10.82
(2nd survey) Accident/injury		
Not selected		21.64
Selected		78.36
Values are percentages.		
^a Values are means and (standard deviations).		

Table 2: Descriptive Statistics of the Variables in the Analysis (cont'd)		
Variable		n = 20,413
<i>Mother's background</i>		
Age at birth of the first child ^a		28.63 (4.26)
Tobacco use		
Non-smoker		84.62
Current smoker		15.38
Educational attainment		
Junior high school graduate		4.81
High school graduate		36.23
Vocational school graduate		18.41
Junior college graduate		25.00
College graduate and above		15.55
Employment status at the time of the first survey		
Unemployed/students		75.60
Full-time employees currently on maternal leave		15.27
Full-time employees who did not take a maternal leave		2.76
Part-time employee		2.70
Self-employed		3.67
Coresidence with child's grandmother		
No		82.49
Yes		17.51
Values are percentages.		
^a Values are means and (standard deviations).		

Tables 3 and 4 show bivariate relationships between sex of the first-born and second birth. There is no significant difference between whether a second child is born or not depending on the sex of the first-born child. Duration in months to a second birth was slightly shorter for first-born boys than for girls; however, as Kaplan-Meier survival curves for time to parity progression by sex of first-born child shows, both curves are almost identical (Figure 1).

Table 3: Percentage of second birth occurrence, by sex of first-borns			
	With second child	Without second child	sig.
First-born=Boy	34.9	65.1	
First-born=Girl	35.2	64.8	

Table 4: Duration (months) to second birth, by sex of first-borns^a				
	n	mean	SD	sig.
First-born=Boy	6804	33.3	12.5	*
First-born=Girl	6455	33.8	12.6	
^a Of those with a second birth only				
* p<.05; Significant mean difference between first-born boys and girls				

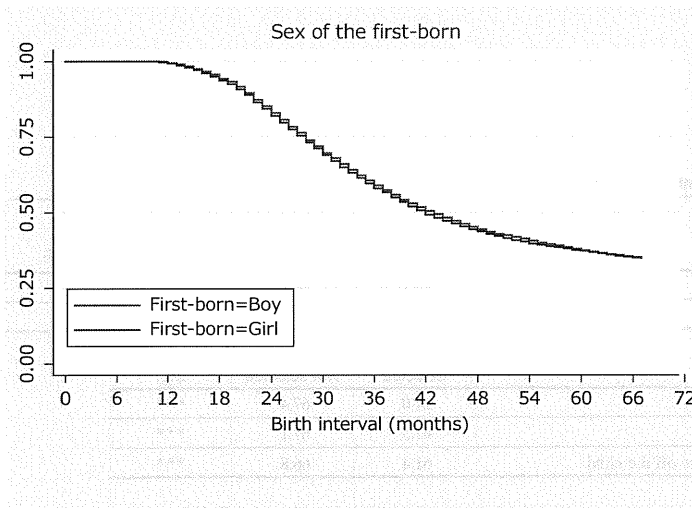


Figure 1: Kaplan-Meier survival estimates by sex of the first-born

Table 5 presents bivariate associations between subjective and objective measures of parenting difficulty and second birth. Overall, a significantly higher percentage of second births occurred among parents whose first-borns were not difficult to raise compared to those whose first-borns were difficult to raise. An exception to this is first-borns with accident/injury experience; first-borns with such experience had a slightly higher percentage of having a younger sibling than those without an accident/injury experience. This may be because the variable includes such small injuries as “accidentally cut himself/herself,” and the majority of parents (78%) report at least some kind of accident/injury occurring. Parents who are so sensitive they don’t even let a minor injury occur may be a group of people that struggle with parenting, hence hesitate subsequent children. Duration to a second birth (Table 6) was also longer among parents who perceived their first-borns difficult to raise on several subjective

measures and whose first-borns were prone to sickness by 18-months of age. Figure 2 and 3 present Kaplan-Meier survival curves of time from first to second birth according to parenting difficulty categories for each measure of parenting difficulty. Overall, groups of parents experiencing parenting difficulty had a slower transition to second birth and eventually a decreased probability of giving birth to a second child compared to groups with less parenting difficulty

Table 5: Percentage of second birth occurrence, by parenting difficulty

	Very concerned	Somewhat concerned	Not very concerned	sig.
Subjective parenting difficulty				
(1st survey) Concerned about raising your child	56.1	64.1	68.2	***
(2nd survey) Concerned about raising your child	53.3	64.3	68.5	***
Subjective parenting difficulty	Selected	Not selected		sig.
	61.0	67.4		***
(2nd survey) Physical exhaustion from parenting	61.5	67.1		***
(2nd survey) Child needs close supervision/can't take eyes off the child	61.4	66.8		***
Objective parenting difficulty	Selected	Not selected		sig.
(1st survey) Child gets sick often	55.1	65.1		***
(2nd survey) Child gets sick often	59.9	65.2		***
(2nd survey) Hospitalization	62.7	65.2		*
(2nd survey) Accident/injury	65.6	63.1		**

* p<.05; ** p<.01; *** p<.001; Significant overall chi-square for the association between parenting difficulty and second birth occurrence

Table 6: Duration (months) to second birth, by parenting difficulty^a

	n	mean	SD	sig.
(1st survey) Concerned about raising your child: Very concerned	747	35.1	12.4	***
(1st survey) Concerned about raising your child: Somewhat concerned	7647	34.0	12.6	
(1st survey) Concerned about raising your child: Not very concerned	4846	32.6	12.4	
(2nd survey) Concerned about raising your child: Very concerned	618	35.4	13.3	***
(2nd survey) Concerned about raising your child: Somewhat concerned	7557	33.8	12.7	
(2nd survey) Concerned about raising your child: Not very concerned	4876	32.9	12.3	
(1st survey) Physical exhaustion from parenting: Selected	4708	34.5	0.2	***
(1st survey) Physical exhaustion from parenting: Not selected	8551	33.0	0.1	
(2nd survey) Physical exhaustion from parenting: Selected	4718	33.5	0.2	
(2nd survey) Physical exhaustion from parenting: Not selected	8541	33.5	0.1	
(2nd survey) Child needs close supervision/can't take eyes off the child: Selected	4251	33.2	0.2	
(2nd survey) Child needs close supervision/can't take eyes off the child: Not selected	9008	33.7	0.1	
(1st survey) Child gets sick often: Selected	190	33.5	1.0	
(1st survey) Child gets sick often: Not selected	13069	33.7	0.1	
(2nd survey) Child gets sick often: Selected	562	35.8	0.6	***
(2nd survey) Child gets sick often: Not selected	12697	33.4	0.1	
(2nd survey) Hospitalization: Selected	1385	34.1	0.4	
(2nd survey) Hospitalization: Not selected	11874	33.5	0.1	
(2nd survey) Accident/injury: Selected	10122	33.6	0.1	
(2nd survey) Accident/injury: Not selected	2690	33.4	0.2	

^aOf those with a second birth only
*** p<.001; Significant mean difference between/across categories of parenting difficulty

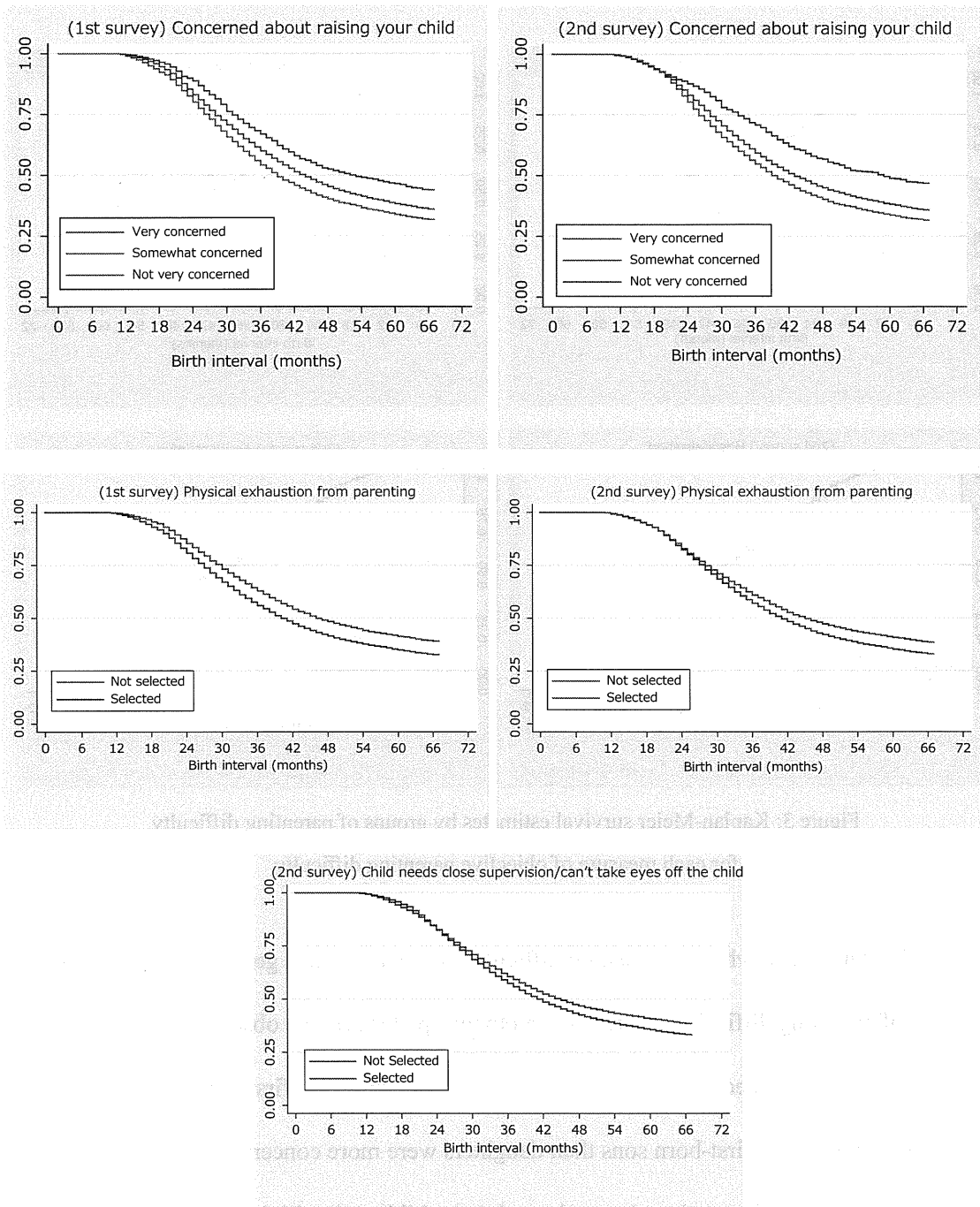


Figure 2: Kaplan-Meier survival estimates by groups of parenting difficulty for each measure of subjective parenting difficulty

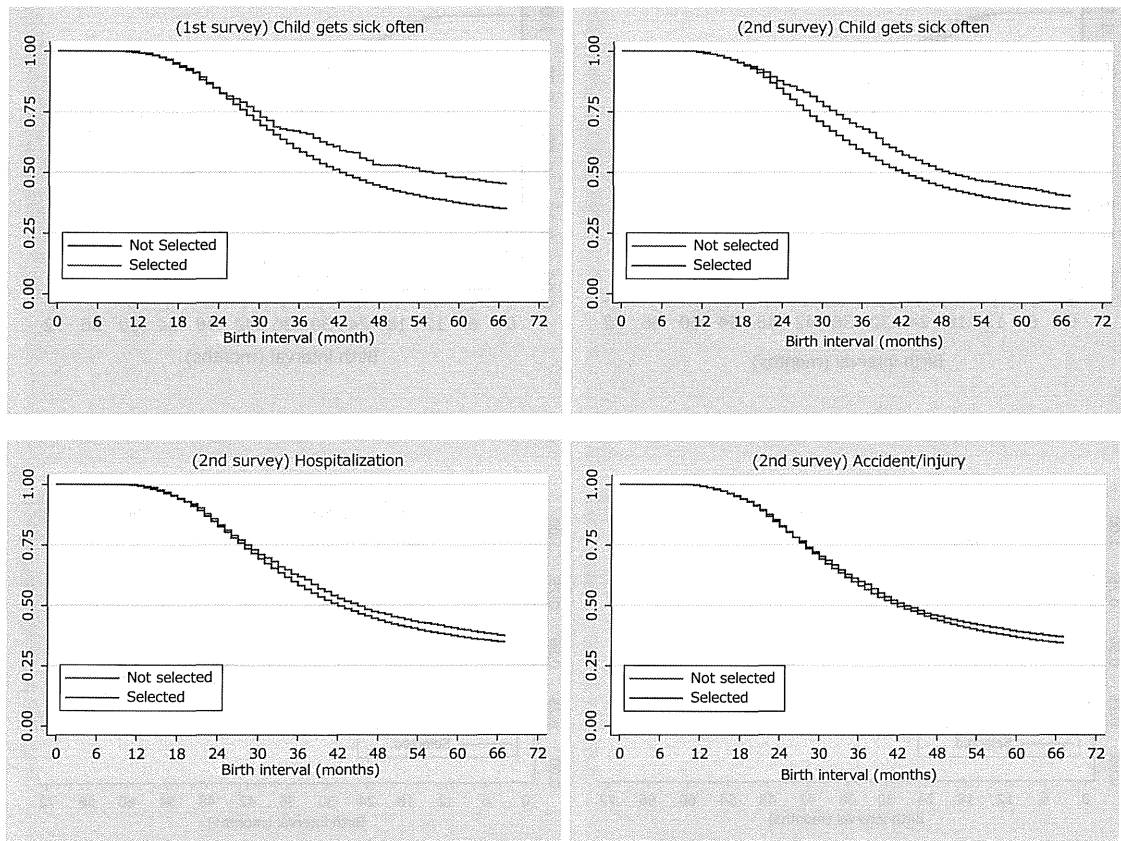


Figure 3: Kaplan-Meier survival estimates by groups of parenting difficulty for each measure of objective parenting difficulty

To get an idea whether parenting difficulty differs by child's gender, Table 7 shows measures of parenting difficulty by gender. An obvious pattern can be observed; parents of first-born boys experienced more parenting difficulty than parents of first-born girls. A higher percentage of parents of first-born sons than daughters were more concerned about their parenting, physically exhausted, and experienced their child getting ill, hospitalized, injured and/or in accidents.

Table 7: Parenting difficulty, by sex of first-borns (values are percentages)				
Subjective parenting difficulty	Very concerned	Somewhat concerned	Not very concerned	sig.
	(1st survey) Concerned about raising your child: Boy	7.1	58.9	
(1st survey) Concerned about raising your child: Girl	6.0	58.3	35.7	
(2nd survey) Concerned about raising your child: Boy	6.2	59.5	34.3	***
(2nd survey) Concerned about raising your child: Girl	5.3	57.8	36.9	
Subjective parenting difficulty	Selected	Not selected	sig.	
(1st survey) Physical exhaustion from parenting: Boy	38.8	61.2	**	
(1st survey) Physical exhaustion from parenting: Girl	36.8	63.3		
(2nd survey) Physical exhaustion from parenting: Boy	38.6	61.4	**	
(2nd survey) Physical exhaustion from parenting: Girl	36.6	63.4		
(2nd survey) Child needs close supervision/can't take eyes off the child: Boy	37.0	63.0	***	
(2nd survey) Child needs close supervision/can't take eyes off the child: Girl	30.6	69.4		
Objective parenting difficulty	Selected	Not selected	sig.	
(1st survey) Child gets sick often: Boy	2.1	97.9	***	
(1st survey) Child gets sick often: Girl	1.3	98.7		
(2nd survey) Child gets sick often: Boy	5.5	94.5	***	
(2nd survey) Child gets sick often: Girl	3.6	96.4		
(2nd survey) Hospitalization: Boy	12.6	87.4	***	
(2nd survey) Hospitalization: Girl	8.9	91.1		
(2nd survey) Accident/injury: Boy	80.5	19.5	***	
(2nd survey) Accident/injury: Girl	76.1	23.9		

** p<.01; *** p<.001 Significant overall chi-square for the association between child's sex and the parenting difficulty measure

Table 8 presents estimated hazard ratios of the clog-log models for having a second birth. Model 1 examines the effect of gender of the first-born controlling for mother's background and coresidence with a grandmother. Contrary to the gender preference hypothesis, sex of the first-born had no significant effect on parity progression; all else equal, parents of first-born boys and girls had similar experiences of transition to a second birth. Looking at the control variables, younger mothers, non-smoking mothers, and mothers with higher education had a greater hazard of giving birth to another child. Compared to unemployed mothers, full-time working mothers who were on maternal leave when their first child was 6 months old had a significantly higher hazard for parity progression. On the other hand, mothers who were part-time employees and self-employed had a lower hazard for parity progression relative to unemployed mothers.

To test the parenting difficulty hypothesis, Model 2 adds parenting difficulty of the first-born at 6 months of age, and Model 3 adds parenting difficulty of the first-born at 18 months of age in the analysis. In Model 2, parenting difficulty, both subjective and objective, appear to have a significant effect on the hazard of an additional birth. Having parenting concerns and being physically exhausted significantly decreased the probability of parity progression. Parents of first-borns prone to illness were less likely to go on to have another child. These findings support the parenting difficulty hypothesis.

In Model 3, overall, parents whose first-borns were difficult to parent their 18-month olds were less likely to have a second child. Controlling for all other predictors, those who were very concerned about their parenting, exhausted and attended to their child closely had a significantly lower hazard of a second birth. First-borns who often get sick and have been hospitalized by 18 months old had a lower risk of welcoming a younger sibling. Although having experienced an accident and/or injury unexpectedly increased the probability of parity progression, this may be due to reasons indicated earlier. As in Model 1, contrary to my expectation, transition to a second birth did not significantly differ by sex of the first-born in Models 2 and 3.

Table 8: Estimated Hazard Ratios for the Discrete Time Cloglog Model of Probability of a Second Birth				
Predictor	Model 1	Model 2	Model 3	
	exp(b)	exp(b)	exp(b)	
Sex of the first-born child				
Boy (ref)				
Girl	0.981	0.975	0.968	
<i>Subjective parenting difficulty of the first child</i>				
(1st survey) Concerned about raising your child				
Very concerned		0.873 ***		
Somewhat concerned		0.954 **		
Not very concerned (ref)				
(2nd survey) Concerned about raising your child				
Very concerned			0.959 **	
Somewhat concerned			0.998	
Not very concerned (ref)				
(1st survey) Physical exhaustion from parenting		0.888 ***		
(2nd survey) Physical exhaustion from parenting			0.927 ***	
(2nd survey) Child needs close supervision/can't take eyes off the child			0.916 ***	
<i>Objective parenting difficulty of the first child</i>				
(1st survey) Child gets sick often		0.815 **		
(2nd survey) Child gets sick often			0.855 ***	
(2nd survey) Hospitalization			0.930 *	
(2nd survey) Accident/injury			1.050 *	
<i>Mother's Background</i>				
Age at birth of the first child	0.932 ***	0.934 ***	0.933 ***	
Tobacco use				
Non-smoker (ref)				
Current smoker	0.762 ***	0.761 ***	0.771 ***	
Educational attainment				
Junior high school graduate	0.778 ***	0.779 ***	0.789 ***	
High school graduate (ref)				
Vocational school graduate	1.161 ***	1.160 ***	1.157 ***	
Junior college graduate	1.120 ***	1.200 ***	1.197 ***	
College graduate and above	1.170 ***	1.180 ***	1.166 ***	
Employment status at the time of the first survey				
Unemployed/students (ref)				
Full-time employees currently on maternal leave	1.066 **	1.065 **	1.074 **	
Full-time employees who did not take a maternal leave	0.928	0.926	0.931	
Part-time employee	0.876 *	0.868 *	0.886 *	
Self-employed	0.890 *	0.883 *	0.898 *	
Coresidence with child's grandmother				
	1.031	1.025	1.024	
Month (time)	1.020 ***	1.020 ***	1.021 ***	
constant	0.075 ***	0.077 ***	0.076 ***	
person-months	913501	913501	881237	
log-likelihood	-67422.418	-67377.588	-65076.315	
LR chi ²	2825	2914.66	2845.41	
degrees of freedom	13	17	20	

* p<.05; ** p<.01; *** p<.001

Summary and Discussion

The purpose of this paper was to investigate whether the sex of the first-born and/or parenting difficulty of the first-born affect transition to a second birth. Given an increasing preference for daughters in Japan, I anticipated that parents with a first-born boy (i.e. possibly the “unpreferred” sex) are more likely to transition to another birth than parents of a first-born girl (i.e. possibly the “preferred” sex) in order to go on to secure a child of the preferred sex. Contrary to my expectation, however, sex of the first-born did not affect parity progression among Japanese couples. This result is surprising in light of previous research of countries with widespread gender preference indicating gender preference influences fertility behavior. In the case of the Japanese, even with prevailing daughter preference, such gender *preference* does not appear to translate into reproductive *behavior*. Though parents whose first-born was a son and first two children were both sons were more likely than others to report that they “intend” to have another child (Moriizumi 2008), my finding suggests that such intention is in fact not put into action. This is actually an intriguing finding; gender preference is not translated into behavior in Japan.

There is one possible explanation for this finding. Among Japanese couples, the average ideal and intended number of children are both about 2 (National Institute of Population and Social Security Research 2011). A preference for a balanced sex composition of children (e.g. one of each sex) is also a common type of preference. Therefore, it is possible that the effect of gender preference on fertility is not quite evident up to parity two; the effect may become apparent at higher parities. Recommendation for future research is to extend analyses to incorporate the potential effect of gender preference at higher parities.

In line with literature on the effect of child’s socioemotional and behavioral traits on second birth, I also explored an alternative possibility that parents of first-born boys may rather

delay or not have another child given boys are considered more difficult to raise. Since sex of the first-born did not have a significant effect on subsequent fertility, this possibility is also not supported. Apparently, regardless of the sex, ease of parenting of the first-born promotes a second child. Parents who are happy with their parenting and are not burdened by the responsibilities parenting entail are enthusiastic about having a larger family. Also, parents fortunate to have a healthy child may feel positive enough to consider having more children.

My findings have some policy implications. With Japan's longstanding issue of low fertility, the government has been implementing policies that include development of support systems for parents to address concerns and burden associated with rearing infants and small children. For example, all households with newborns are visited by a certified staff within 4 months from birth to consult any needs they may have. Also, community child support centers have been established in many communities with the aim of easing parenting concerns and burden. These centers allow parents with young children to come together to communicate with each other and to discuss concerns with specialized staff. Continued efforts in addressing parenting burden are needed for the well-being of children and parents. Efforts to develop a parenting-friendly environment may also eventually contribute to promoting fertility. Past research has found mothers of difficult children at 18 months of age report higher child-rearing stress than mothers of easy children (Honjo et al. 1998). Therefore, not only parents under child-rearing stress but also parents raising difficult children must be identified early so they can especially benefit from the public services available.

References

- Choi, Hyung-Jai, Jutta M. Joesch and Shelly Lundberg. 2008. "Sons, Daughters, Wives, and the Labour Market Outcomes of West German Men." *Labour Economics* 15: 795-811.
- Fuse, Kana. 2013. "Daughter Preference in Japan: A Shift in Gender Role Attitudes?" *Demographic Research* 28: 1021-1052.
- Honjo, Shuji, Rie Mizuno, Miyoko Ajiki, Atsuko Suzuki, Masako Nagata, Yumie Goto and Takanori Nishide. 1998. "Infant Temperament and Child-rearing Stress: Birth Order Influences." *Early Human Development* 51: 123-135.
- Jayachandran, Seema and Ilyana Kuziemko. 2011. "Why Do Mothers Breastfeed Girls Less than Boys? Evidence and Implications for Child Health in India." *The Quarterly Journal of Economics* 126:1485-1538.
- Jokela, Markus. 2010. "Characteristics of the First Child Predict the Parents' Probability of Having Another Child." *Developmental Psychology* 46:915-926.
- Larsen, Ulla, Woojin Chung and Monica Das Gupta. 1998. "Fertility and Son Preference in Korea." *Population Studies* 52:317-325.
- Ministry of Health, Labour and Welfare. 2010. "Special Report on Vital Statistics: Summary of Statistics Related to Births in 2010 (In Japanese)." Tokyo, Japan: Ministry of Health, Labour and Welfare. Retrieved February 13, 2014.
(<http://www.mhlw.go.jp/toukei/saikin/hw/jinkou/tokusyu/syussyo06/dl/01.pdf>).
- Ministry of Health, Labour and Welfare. 2013. *Summary of Vital Statistics 2012*. Tokyo, Japan: Ministry of Health, Labour and Welfare.
- Moriizumi, Rie. 2008. "An Empirical Study of Sex Preferences for Children in Japan." *Journal of Population Problems* 64(1):1-20. (In Japanese).
- National Institute of Population and Social Security Research. 2011. *Marriage Process and Fertility of Japanese Married Couples: Overview of the Results of the Fourteenth Japanese National Fertility Survey in 2010*. Tokyo, Japan: Institute of Population and

Social Security Research.

National Institute of Population and Social Security Research. 2014. *Latest Demographic Statistics*. Population Research Series, No. 331. Tokyo, Japan: National Institute of Population and Social Security Research.

Peacock, Janet L., Louise Marston, Neil Marlow, Sandra A. Calvert and Anne Greenough. 2012. "Neonatal and Infant Outcome in Boys and Girls Born Very Prematurely." *Pediatric Research* 71: 305-310.

Tokyo Fire Department. 2012. "Data on Infant and Childs Taken to Hospitals by Ambulances (in Japanese)." Tokyo, Japan: Tokyo Fire Department. Retrieved February 13, 2014 (http://www.tfd.metro.tokyo.jp/hp-seianka/baby/data/baby_trouble_all.pdf).

Waldron, Ingrid. 1983. "Differences in Human Mortality: The Role of Genetic Factors." *Social Science and Medicine* 17: 321-333.

Weinraub, Marsha, Randall H. Bender, Sarah L. Friedman, Elizabeth J. Susman, Bonnie Knoke, Robert Bradley, Renate Houts and Jason Williams. "Patterns of Developmental Change in Infants' Nighttime Sleep Awakenings from 6 through 36 Months of Age." *Developmental Psychology* 48: 1511-1528.