Low Fertility in Japan: Intentions and Behavior, 2000–2009

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Using longitudinal data drawn from a 2000 national survey and its follow-up in 2009, this study examines the relationship between fertility intentions of women and men—both married and unmarried—at younger reproductive ages and their subsequent fertility behavior and, for never-married, their subsequent first marriage.

Since the mid-1970s, Japan's fertility has been declining to below replacement levels, reaching a TFR of 1.5 per woman in the 1990s, and further down to 1.3 to 1.4 in the 2000s (National Institute of Population and Social Security Research 2012: 50–51). Even though our estimates indicate that a tempo adjustment for postponed fertility raises its TFR to the level of 1.4 to 1.5 per woman for 2000–2010,[1] Japan's fertility level remains well below replacement.

While the primary direct factor of this very low fertility has been increasing delay of marriage and less marriage (Iwasawa 2002), there is a sign in recent years that Japanese couples are not having as many children as they want (Tsuya 2009). As we show below, while fertility intentions are positively associated with subsequent fertility, a substantial proportion of Japanese wives and husbands fail to achieve their fertility intentions. Thus, an examination of the factors underlying an inability of spouses to reach their fertility intentions may provide an important insight about the mechanisms producing Japan's low fertility.

Further, childbearing has been closely tied to marriage in Japan where non-marital fertility has remained at around 1–2 percent of all births since 1960 (National Institute of Population and Social Security Research 2012: 67). To the extent that a main purpose of marriage is to have children, fertility intentions of never-married young Japanese may also play an important role in determining not only their subsequent fertility but also their marriage behavior. By accounting for the factors that affect the relationship between fertility intentions of the never-married and their subsequent marriage and fertility behaviors, this study may also help explain why Japan's fertility is so low.

Japan' situation is by no means unique. With an exception of some countries in which fertility levels have been at replacement levels and women, in the aggregate, succeed in meeting their fertility intentions (Morgan and Rackin 2010; Quesnel-Vallée and Morgan 2003), fertility levels in most developed countries remain substantially below replacement even adjusting for postponement (Bongaarts 2002; Goldstein, Sobotka and Jasilioniene 2009), and women consistently underachieve their fertility intentions (Bongaarts 2001; Hagewen and Morgan 2005).

What is unique is that Japan is the first non-Western country to enter the post-industrial stage of economic development with dramatically different cultural background from the West. Confucian values place heavy emphasis on obligations to family and society, leaving little room for self-interest (Taeuber 1958: 100–104; Bumpass et al. 2009), and forces of economic changes are likely filtered through this cultural setting. Studies find that views about marriage and children have been, though not consistently, changing in Japan, moving away from the traditional normative

[1] This tempo adjustment is estimated, assuming that age at marriage has not changed since 1995.

imperatives of marriage and childbearing (Choe et al. 2012; Lee, Tufiş and Alwin 2010; Retherford, Ogawa and Sakamoto 1996). They in turn suggest the increasing legitimacy of individual choice in marriage and fertility decision-making, as opposed to obligatory compliance with traditional expectations, thus underlining the increasing importance of fertility intentions in accounting for fertility behavior.

In the 2000s, the period under study, the Japanese economy and the nature of its labor market have undergone fundamental changes. Starting with the burst of "bubble economy" at the end of the 1980s, the country has been in a prolonged economic downturn (Johnsson 2005), and types of jobs available have changed dramatically. In an attempt to increase their competitiveness in the face of economic globalization, employers began in the 1990s to move away from lifetime employment, a long prevalent feature of the Japanese labor market. This resulted in rapid declines in regular employment with job security and career prospects, replaced by the proliferation of temporary employment especially among young persons (Igarashi 2009). The prolonged economic stagnation and decreasing employment security likely influence fertility intentions and behavior of Japanese men and women.

Given these economic and normative changes, and their possible interdependence with fertility (Lutz, Skirbekk and Testa 2006), it is important to test how fertility intentions are related to subsequent fertility behavior. As such, Japan provides an interesting case study of the interplay between traditional familial values and changing economic situations in structuring the relationship between intentions—persons' future plans in the context of circumstances—and actual behavior.

Data and Measures

This study draws data from the 2000 National Surveys on Family and Economic Conditions (NSFEC). The survey is a nationally representative sample of Japanese men and women aged 20–49. Using a stratified, two-stage probability sampling based on the 1995 population census tracts distribution, it obtained 4,482 usable responses (for details, see Rindfuss et al. 2004). The survey oversampled those aged 20–39, and weights are used to account for this oversampling as well as the differential response rates by age, sex and size of place of residence. The 2000 respondents were followed up in 2009, resulting in a panel of 2,356 respondents. To adjust for the probability of successful follow-up, panel weights are also used.

Given that fertility intentions are only relevant in the prime reproductive years, and that Japan has a relatively late age pattern of childbearing with birth rates of women age 35–44 increasing considerably during the 1990s to the 2000s (National Institute of Population and Social Security Research 2012: 58), we limit our analysis to women and men age 20–39 in 2000. To examine the relationship between fertility intentions and subsequent fertility and, for never-married, first marriage, we focus on 1,706 persons (737 men and969 women) age 20–39 in 2000 who are followed up in 2009.

The dependent variables of this study are the probability of having a child and, for never-married, the likelihood of first marriage during 2000–2009, and later in the paper, fertility intentions. Table 1 presents the numbers of persons who experienced a birth/births and, among never-married, first marriages during the study period by respondents' sex and marital status in 2000.

To measure fertility intentions, a key independent variable and subsequently a dependent variable, the 2000 NSFEC (and its 2009 follow-up) asked all the respondents how strongly they want to have a child, by providing the Likert-scale-like response categories ranging from "definitely not" to "yes definitely" with "uncertain" in the middle. We coded the responses so that a higher score indicates a stronger desire for a/nother child. To those who answered "yes definitely" or "yes probably" to the question above, the survey then asked how many children they wanted altogether, and also when they wanted to have a next/first child. Using this additional information, we plan to include in this paper more analyses based on the variables measuring intended total family size and the intended timing of a next birth.

Our multivariate analysis includes basic demographic and socioeconomic variables known to affect fertility and fertility intentions, including the number of children, age, sex, marital status, education, and place of upbringing. These control variables are all based on the 2000 information. Because fertility intentions strongly depend on the number of children persons already have, we need to control for this variable. Since the 2000 NSFEC asked family size only of ever-married women and men, we assign zero to never-married respondents included in the analysis. Given that out-of-wedlock fertility is minimal in Japan (1–2 percent of all births since 1960), this assumption is reasonable. This variable is categorical, consisting of zero (no child), one, two, and three or more.

Age is also coded as a categorical variable: 20–29, 30–34, and 35–39. Educational attainment is also categorical, consisting of junior high school or less, high school, junior college or equivalent, and four-year college or more. The category of junior college or equivalent includes college of technology called "*kōtō-senmon-gakko*", and post-high-school vocational training school called "*senshū-gakko*." Urban upbringing is a dichotomous variable indicating whether the place a respondent lived until graduation from elementary school is primarily an urban area or not.

Finally, when our analysis pools data of both sexes, and persons of all marital statuses, our model includes dichotomous variables indicating a respondent is female or not, and currently married or not, respectively. We plan to test other background variables to better index respondents' social, economic and normative circumstances.

Results of Bivariate Analyses

Table 2 presents the percentage distributions on fertility-intentions categories, by sex and marital status of Japanese men and women aged 20–39 in 2000 who followed up in 2009. While there is in general little gender difference in the distribution of fertility intentions, we see clear gender differences when we look at the currently married and the never-married separately. While currently married women are less likely to want to have a child than their male counterparts, never-married women are somewhat more likely to want a child compared to single men. It is also notable that around 20 to 30 percent reported that they were uncertain about wanting a/nother child.

Turning to the association between fertility intentions and subsequent fertility behavior, we can see from Table 3 that fertility intentions are in general positively associated with subsequently having a child. As expected, this is particularly so among the currently married (both men and women). This is also a strong association among never-married women, but only a weak one among never-married men.

Further, fertility intentions of never-married women and men are also strongly and positively associated with their subsequent marriage behavior. As shown in Table 4, the stronger their fertility intentions in 2000, the more likely they married during 2000–2009.

The association between fertility intentions and subsequent fertility varies by age. While, as expected, the percentage of having a birth increases with stronger fertility intentions and decreases with age, women age 30–39 tend to have a child only when they want one (see Table 5). Nonetheless, the proportion of actually having children is quite low—about 50 percent—even among women age 20–29 who definitely wanted to have them. It is also notable that the link between uncertainty about wanting a child and subsequent fertility varies markedly by age. While a substantial proportion of women age 20–29 who were uncertain (or even did not want a child) in 2000 have since had a child, only a very small proportion of those age 30–39 who had expressed uncertainty had a child subsequently. This suggests that while 'uncertain' responses are a transitional stage in between wanting and not wanting, as women become older, uncertainty likely results in having no more children.

Further, the relationship between fertility intentions and outcome also varies by education. As shown in Table 6, as education levels rise, the positive link between fertility intentions and behavior becomes stronger. Men and women who are college-educated tend to have a child only when they want one.

Planned Multivariate Analyses

We plan to examine how fertility intentions predict subsequent fertility and, for never-married, subsequent first marriage, controlling for basic demographic and socioeconomic factors. The multivariate analyses are conducted by sex for all marital statuses as well as for the currently married and the never-married, separately. Given the high likelihood of marriage and childbearing being interdependent for never-married Japanese women and men, we plan to estimate the effects of fertility intentions simultaneously, using the bivariate probit regression model.

We also plan to examine the effects of prefecture-level economic conditions on fertility intensions for three variables: (1) the male unemployment rate; (2) the proportion of new graduates (high school and higher-level schools) who obtain regular employment within one year after graduation; and (3) the prefecture-level per capita gross domestic product (in constant terms). For this analysis, data on the number of additional children wanted will be combined with the number of children women and men have to create a measure of total number wanted at each date. Sensitivity tests will also be conducted to examine the implication of "uncertain" responses.

Because we have both individual-level characteristics and community (prefecture)-level characteristics, we use a multi-level model. The basic model is:

$$F_{ijt} = T_t + X_{ij}\alpha + Z_{ijt}\beta + U_{jt}\gamma + R_{jt}\delta + G_j\lambda + \nu + \mu$$

where F_{ijt} is the fertility intention of individual i in community j measured at time t;
T_t indicates survey time (*1* for 2000 and *2* for 200*9*);
X_{ij} is a vector of time-invariant exogenous characteristics of individual i (gender, urban-rural childhood residence, parents' education, and number of siblings) in community j;
Z_{ijt} is a vector of time-varying exogenous characteristics of individual i (age and number of

surviving parents) in community j measured at time t;
U_{jt} is the unemployment rate in community j at time t;
R_{jt} is the proportion of new graduates (senior high school and higher level schools) who obtain "regular" employment within one year after graduation in community j at time t;
G_{jt} is the per capita gross domestic product (in constant terms) in community j at time t;
v_j is the time-invariant error-term for community j;
μ_{ij} is the time-invariant error-term for individual i in community j;
ε_{ijt} is the time-varying error-term for individual i in community j at time t.

Fertility intentions are affected by many unmeasured individual-level and community-level time-invariant variables. As the estimation of the above equation needs to control for such unmeasured variables, we use a first difference model to control for unobserved time-invariant individual-level and community-level characteristics.

The equation below includes the time-invariant community-level error term (v_j), but for simplicity of the presentation, does not include the time-varying community-level error term. We will consider adding a time-varying community-level error term in actual analyses to account for the changes in prefecture-level characteristics. By differencing two equations derived from the above equation, one for each time, we obtain the estimation equation:

$$(F_{ij2} - F_{ij1}) = \tau + (Z_{2j} - Z_{1j})\beta + (U_{2j} - U_{1j})\gamma + (R_{2j} - R_{1j})\alpha + (G_{2j} - G_{1j})\delta + (\varepsilon_{ij2} - \varepsilon_{ij1})$$

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Table 1. The Numbers of Persons Who Experienced a Birth/Births and First Marriage during 2000–2009 by Sex and Marital Status: Japanese Aged 20–39 in 2000

Marital status in 2000	Births	First marriages	(Base N)
All statuses			
Men	199	--	(737)
Women	274	--	(969)
Currently married			
Men	102	--	(300)
Women	129	--	(488)
Never-married			
Men	91	130	(417)
Women	140	199	(446)

Table 2. Percentage Distribution of Fertility Intentions by Sex and Marital Status in 2000: Japanese Aged 20–39 in 2000 Who Are Followed Up in 2009

	Want to have a child?					
	Definitely not	Probably not	Uncertain	Yes probably	Yes definitely	(N)
All marital statuses						
Both sexes	7	14	25	30	24	(1,695)
Men	4	12	30	31	23	(732)
Women	9	16	20	30	25	(963)
Currently married						
Both sexes	13	23	26	20	18	(787)
Men	10	19	31	20	20	(300)
Women	16	25	23	20	16	(487)
Never-married						
Both sexes	1	7	24	38	30	(855)
Men	1	6	29	37	26	(413)
Women	2	7	19	39	33	(442)

Notes: Percentages are weighted; the number of cases are unweighted.

Table 3. Percentage Having a Child/Children during 2000–2009 by Fertility Intentions in 2000: Japanese Aged 20–39 by Sex and Marital Status in 2000

	Want to have a child in 2000?					
	Definitely not	Probably not	Uncertain	Yes probably	Yes definitely	(N)
All marital statuses						
Both sexes	6	13	20	35	46	(1,688)
Men	10	15	20	31	43	(729)
Women	4	12	21	39	50	(959)
Currently married						
Both sexes	6	15	22	56	66	(784)
Men	12	20	23	58	70	(298)
Women	4	12	22	54	61	(486)
Never-married						
Both sexes	[6]	9	20	27	36	(851)
Men	[0]	[3]	20	21	26	(412)
Women	[10]	16	22	33	45	(439)

Notes: Percentages are weighted; the number of cases are unweighted. Numbers in square parentheses are based on less than 30 cases.

Table 4. Percentage Married during 2000–2009 by Fertility Intentions in 2000: Never-married Japanese Aged 20–39 in 2000

	Want to have a child in 2000?				
	No[a]	Uncertain	Yes probably	Yes definitely	(N)
Both sexes	22	30	39	47	(855)
Men	13	27	31	39	(413)
Women	32	35	48	53	(442)

Notes: Percentages are weighted; the number of cases are unweighted.
a—'Definitely not' and 'probably not' combined.

Table 5. Percentage Having a Child/Children in 2000–2009 by Fertility Intentions and Age in 2000: Japanese Aged 20–39 in 2000 of All Marital Statuses

	Want to have a child in 2000?					
	Definitely not	Probably not	Uncertain	Yes probably	Yes definitely	(N)
Both sexes						
Age 20–29	[14]	28	29	37	47	(788)
Age 30–34	9	14	25	40	53	(401)
Age 35–39	3	5	13	22	25	(499)
Women						
Age 20–29	[20]	34	38	42	50	(445)
Age 30–34	[5]	9	14	38	55	(230)
Age 35–39	0	2	10	28	[24]	(284)

Notes: Percentages are weighted; the number of cases are unweighted. Numbers in square parentheses are based on less than 30 cases.

Table 6. Percentage Having a Child/Children in 2000–2009 by Fertility Intentions and the Number of Children in 2000: Currently Married Japanese Aged 20–39 in 2000

	Want to have a child in 2000?			
	No[a]	Uncertain	Yes[b]	(N)
Both sexes				
Zero	[35]	[40]	78	(109)
One	[28]	[33]	66	(170)
Two	12	16	34	(358)
Three or more	3	18	[22]	(147)
Women				
Zero	[38]	[43]	71	(64)
One	[19]	[37]	66	(100)
Two	9	16	37	(486)
Three or more	0	[14]	[0]	(101)

Notes: Percentages are weighted; the number of cases are unweighted. Numbers in square parentheses are based on less than 30 cases.

a—'Definitely not' and 'probably not' combined.

b—'Yes definitely' and 'yes probably' combined.

Table 7. Percentage Having a Child/Children in 2000–2009 by Fertility Intentions and Education in 2000: Currently Married Japanese Aged 20–39 in 2000

	Want to have a child in 2000?					
	Definitely not	Probably not	Uncertain	Yes probably	Yes definitely	(N)
Both sexes						
High school or less	6	15	23	55	52	(372)
Some college or more	5	16	21	57	73	(401)
Men						
High school or less	[19]	19	23	59	[55]	(153)
Some college or more	[5]	[21]	22	[57]	78	
Women						
High school or less	3	12	23	51	56	(259)
Some college or more	[5]	12	20	57	66	(224)

Notes: Percentages are weighted; the number of cases are unweighted. Numbers in square parentheses are based on less than 30 cases.