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Education, Gender Equity, and the Entry into Motherhood in Japan

夫婦のジェンダー関係と第一子出産タイミング

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This article examines the influence of gender-equity within the family on the tempo of first childbearing in Japan. To this end, we applied proportional hazard regression to data from the 1998 National Family Research Survey, supplemented by national-level data on economic performance and the development of family-friendly policy. The results of this study show, firstly, that a more equal sharing of housework between a husband and wife tends to delay her entry into motherhood. Secondly, the relation between female educational attainment and the length of a first birth interval varies depending on the level of gender-equity within the family. More specifically, in households with the egalitarian gender division of domestic work, the influence of wives' educational level on the tempo of first birth is great. In contrast, where housework concentrates on wives, their education has a small impact on childbearing behaviour.

Introduction

In the field of family studies, much attention has been paid to the relation between women's education and their reproductive behaviour. In particular, a rise in female educational attainment has been regarded as one of the driving forces behind fertility changes seen in industrialised countries over the past decades. Such is the case with Japan. Over the past decades, the period total fertility rate has declined from 2.13 in 1970 to 1.36 in 2000, with mother's age at first birth rising from 25.6 to during 28.0 the same period (see Fig. 1).

Since this phenomenon has gone hand in hand with a rise in female educational attainment, it has been argued that an increase in women's entry

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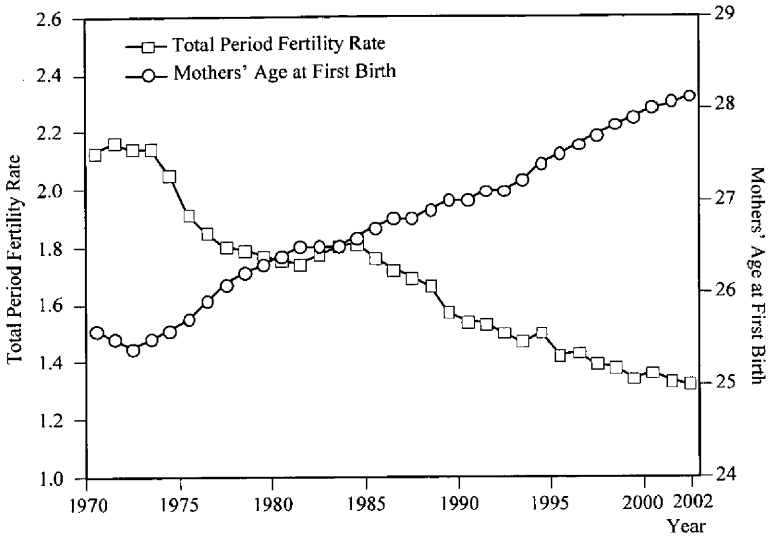


Sources: Ministry of Health and Welfare (various years), Japanese Vital Statistics

Fig. 1 Total Period Fertility Rate and Mothers' Age at First Birth in Japan

into colleges and universities has caused a change in fertility behaviour by enhancing their economic independence (Ogawa and Retherford, 1993 ; Retherford, et al., 1996). In fact, the percentage of women going to 2-year junior colleges or 4-year universities rose steeply from 17.7% in 1970 to 48,5% in 2000 (Ministry of Education, Culture, Sports, Science and Technology, 2003).

Admittedly education has, in demographic literature, been interpreted to be an indicator of various attributes women possess. According to Friedlander and Silver (1967), women's educational level can serve as proxy measures for : (1) contraceptive knowledge ; (2) preference for having children ; (3) aspirations for career ; and (4) earning capacity. Notwithstanding this versatility, in studies on the recent fertility behaviour in industrialized countries, it is most common to use women's educational attainment as an index of their earning power in the labour market. Since education increases one's human

capital, women's wage potential in the labour market rises in tandem with the level of their education. This raises women's opportunity costs related to the bearing and raising of children, thereby decreasing their desire to have children (Becker, 1981 ; Cigno, 1991). Accordingly, a low fertility and a postponed motherhood in industrialised countries are theoretically derived from a rise in female educational attainment.

On the empirical side, however, the relation between women's educational levels and their fertility behaviour is not conclusive. For example, the probability of bearing a third child was greater for better-educated than less-educated women in Norway and Sweden, whereas the relation was the opposite in Great Britain (Hoem and Hoem, 1989 ; Kravdal, 1992 ; Wright, et al., 1988). Similarly, Italy showed a strong negative influence of female educational attainment on the timing of a first birth, while such a relation was not found in West Germany (Blossfeld and Huinink, 1991 ; Blossfeld, 1995). Although these findings have hitherto been attributed to different external factors surrounding families, few studies have examined whether a family's internal conditions affect the association between women's education and fertility behaviour.

The purpose of this article is to investigate the impact of contextual factors within the family upon the fertility patterns of Japanese women. More specifically, we will examine whether the gender equity between a husband and wife changes the impact of female educational attainment on the timing of first childbearing after marriage. In the rest of this paper, we will first consider the relation between women's educational levels and their fertility behaviour, focusing on the gender equity within the family. Subsequently, data and methods employed in this study will be presented. Finally, we will show the results of our analysis and discuss the impact of gender relation on the interval between marriage and first childbearing.

Theoretical Background

According to the economic approach to fertility behaviour, an increase in women's earning capacity in the labour market raises the cost of their time spent in bearing and rearing children. This, in turn, discourages women from having children (Becker, 1981). Generally speaking, since investments in education raises one's earning power in the labour market through the accumulation of one's human capital, higher educational qualifications result in higher wages (Becker, 1975). Thus, based on the economic account of fertility behaviour, better-educated women should have a lower level of fertility and a more delayed entry to motherhood, when compared with less-educated women (Cigno, 1991).

However, empirical studies do not always lend firm support to this theoretical relation. There is a huge cross-country variation in the relation between fertility and women's education, and thus higher female educational attainment does not always cause the postponement, or even the avoidance of motherhood. To take an example, Hoem (1993 a) discovered that the probability of having a third child was greater for women with higher levels of education in Sweden. Likewise, Ní Bhrolcháin (1993) found that the risk of bearing a third child was positively related to the level of women's education in Britain. A similar positive gradient for third birth intensities was observed in Norway and the United States (Kravdal, 1992). In contrast, the negative relation between women's education and third birth was discovered in Great Britain (Wright, et al., 1988). In addition, the level of women's education had little impact on the probability of their giving birth to a third child in Austria, where their age at second birth was controlled (Hoem, et al., 2001).

It is also the case with the impact of women's education on their first birth. For instance, Blossfeld and Huinink (1991) discovered that educational levels in females did not affect the timing of their first birth in West Germany.

Likewise, the effect of women's education on the tempo of first childbearing was very weak and insignificant in Sweden, France, the Netherlands, and Hungary. In contrast with these findings, female educational attainment exerted a strong negative influence on entry into motherhood in Italy (Blossfeld, 1995). Moreover, in Japan, the influence of women's educational credentials on their entry into motherhood varies with time. Ermisch and Ogawa (1994) discovered with survey data in the 1990s that the greater wife's educational attainment, the higher her age at first birth became. Nevertheless, a study using older survey data in the 1970s yielded no significant effect of a wife's education on the timing of her first birth (Morgan, et al., 1984). Although a variation in the relation between women's education and fertility may, to an extent, be attributable to differences in the types of data set employed, these studies indicate that female educational attainment has a complicated impact on their fertility behaviour. Women's higher educational qualifications encourage fertility in some countries; they discourage it in others.

Governmental intervention has been hitherto regarded as one of the important contextual factors in bringing about the aforementioned inconclusive results. Particular emphasis has been placed on the fact that the development of social policies has changed the extent to which women's education affects their reproductive behaviour (Hoem, 1993 b ; Kravdal, 1992 ; Wright, et al., 1988). As is well known, many industrialized countries have, over the past decades, introduced family-friendly policies such as generous parental leave programmes and the ample provision of childcare service. These policies have been designed both to facilitate the combination of employment and family roles and to reduce the opportunity cost of rearing children. If family-friendly policies produce the expected effect, then bearing and rearing children will not bring significant economic loss to well-educated women. This

will consequently cease to discourage them from having children. Hence, it is likely that the negative effect that women's educational attainment has on their fertility is neutralized in a country with more generous social policies for families. Furthermore, the income effect of well-educated women may cause a greater fertility and an earlier entry into motherhood, insofar as they are in a better position to make use of childcare services and parental leave programmes. Indeed, it is argued that the contrast of fertility patters between Austrian and Swedish women was derived from differences in their social policies (Hoem, 1993a, 1993b). More specifically, since family-friendly policies in Sweden created circumstances more favourable for women to combine employment and childrearing than those in Austria, the amount of economic loss entailed by having children was much smaller for Swedish than Austrian women. As a result, in Sweden, the probability of having a third child was greater for women with higher educational qualifications than those without them. Such a positive relation, however, was not found in Austria (Hoem, et al., 2001). Likewise, it is pointed out that, owing to a lack of family policies supporting mothers' employment and childrearing, British women with higher educational attainment showed a significantly low probability of having a third child (Wright, et al., 1988).

However, it is premature to attribute variations in the influence of female education to family-friendly policy only. We should not overlook the influence of gender factors within the family. Since gender systems exert an influence on the opportunities and patterns of women's employment, and the losses sustained through child rearing (Mason, 2001), it is likely that gender relations play a key role in determining the patterns of family formation. Indeed, Davis (1984) maintains that changes in reproductive behaviour in industrialised countries are related to gender equity between the both sexes. Likewise, Blossfeld (1995) and Blossfeld and Drobnič (2001) point out that social norms

concerning gender roles play an important part in a decision on whether to have children. Specifically, in societies with a strong expectation that a mother should be the primary care-taker of children and devote herself to bringing up them, her employment outside the home is socially undesirable and not in harmony with the social norms. Hence, women living in societies that hold such gender norms tend to postpone or give up on childbearing if they wish to remain employed outside the home. In fact, McDonald (2000a, 2000b) argues that one of the most crucial factors causing lowest-low fertility in recent industrialized countries is the unbalanced division of housework between a husband and wife.

Admittedly, since caring for an infant child is a time-intensive activity, it is difficult for parents to reconcile employment outside the home and child rearing. However, to what extent these two activities are compatible depends on the way domestic burdens are shared between a husband and wife. Thus, opportunities for paid work are affected by the structures of constraint (Joshi, 1998). Where domestic tasks are equally shared between a husband and wife, it will be, *ceteris paribus,* easier to for her to combine employment and family life. In this case, since the interruption of employment caused by child rearing is relatively short, mothers will suffer minimal financial loss. In contrast, where childcare and household chores are exclusively imposed on a mother, it is quite difficult for her to be engaged in a gainful employment outside the home. She will most likely have to withdraw from the labour market for a longer period of time than a mother who is not solely responsible for household chores. This being the case, she will incur a great financial loss. In other words, the active participation of the father in childcare and housework will make the mother's child rearing and employment more compatible, thereby reducing the amount of her economic loss. This reduction will, in turn, weaken the negative influence of her opportunity costs on fertility behaviour.

Thus, if the division of housework between a husband and wife is made on a gender-equity basis, her educational attainment is likely to exert little negative influence on reproductive behaviour. Moreover, it might be that the income effect of well-educated women quickens the tempo of childbearing and increases the number of children. In short, we may argue that the influence of women's education on their reproductive behaviour is dependent on the level of a husband's participation in domestic work.

With this point into account, gender equity within the family varies across countries, and may cause a different association between women's educational levels and their fertility. As has been mentioned before, the positive effect of women's educational level on the probability of having a third birth was observed in Sweden, but not in Austria. In the former country, the percentage of the total time spent on unpaid housework in a family was 2.5 hours a day for men and 3.9 hours for women in full-time work. In the latter, contrastingly, men spent only 1.7 hours a day on housework, with the amount of time for women reaching fully 4.8 hours (OECD, 2001). This evidence suggests that the impact of women's educational attainment on fertility may be affected by husband's involvement in housework. Hence, it can be argued that women's educational qualifications serve as either an anti-natalist or pro-natalist factor, depending on the degree to which domestic work is shared between a husband and wife.

This gender perspective is particularly important when considering Japanese demographic behaviour. It has been pointed out that there is gender role segregation in Japanese families (Coleman, 1983 ; Morgan, et al., 1984 ; Tsuya and Mason, 1995). Because of this, the responsibilities of housework and childcare tend to fall upon wives in the family; husbands hardly participate in domestic work. According to the results of the national time use survey in 2000, female employees, on the average, spent 2 hours and 50 minutes a day

on housework (including child care), whereas their male counterparts perfo-rmed housework for only 23 minutes a day (NHK Broadcasting Culture Research Institute, 2001). This evidence indicates that combining work and family is considerably difficult for employed women in Japan, with their heavy domestic burden. Accordingly, the amount of loss that women sustain in Japan by rearing children rises in tandem with their level of education. As mentioned earlier, the previous study found that the levels of women's education were negatively linked to their age at first birth in Japan. If the influence of female educational attainment on fertility is affected by gender equity within a family, the observed gradient is likely to be intensified by the unequal division of domestic labour between a husband and wife. We therefore expect that, where a husband's level of participation in housework is controlled, the delaying effect that a wife's education bears on the timing of childbearing may be weakened, or even neutralized.

Data, Methods, and Variables

The present analysis employed data from the National Family Research Survey (NFRJ98). The Japanese Association of Family Sociology conducted this survey in 1998, and its target population were men and women between the ages of 28 and 77 who lived in Japan at the time of the survey. The overall response rate amounted to 66.5 percent, and a total of 6,985 samples were finally collected by the stratified random sampling method. As women who have experienced a divorce or separation by the death of a spouse differ in their fertility behaviour from women who have not undergone these events, the present study employed only first-married female respondents less than or equal to the age of 50. Their year of birth ranged from the year of 1948 to 1970. Moreover, in order to remove the influence of pregnancy-dependent marriage, respondents who had their first child within eight months of their

marriage were also excluded form the analysis. After excluding cases with missing values on central characteristics, the final sample size used in the present study amounted to 1003.

We will examine the timing of first childbearing by using the Cox proportional hazard analysis. A dependent variable of the analysis was the probability of bearing a first child. As the length of time leading up to first childbearing was measured from the commencement date of a woman's marriage, failure time for each respondent indicated the duration of months between her marriage and first childbearing.

The present analysis included eight time-independent and two time-varying covariates. First, we employed the wife's educational attainment as a covariate. In the analysis, women's education was divided into three groups : (1) junior or senior high school (2) 2-year junior college or vocational school after senior high school graduation (3) 4-year university or higher. Since educational attainment is an indication of the level of human capital, a higher educational qualification should lead to a greater earning capacity. It is assumed in the New Home Economics theory that a higher salary will enhance women's economic independence and raise opportunity costs for having children. It is therefore expected that better-educated wives will bear their first child later than wives with less education.

Secondly, the ratio of housework performance between a husband and wife was involved as an indicator of gender equality within a respondent's household in our analytical model. The NFRJ98 survey contains questions referring to a respondent's and her husband's involvement in housework at the time of the survey. The degree of involvement in housework was measured in terms of three domestic chores : (1) preparing meals ; (2) washing clothes ; and (3) cleaning a bathroom. A respondent chose one out of five answers regarding the frequencies of her and her partner's participation in each

domestic chore : (1) almost everyday ; (2) four or five times a week ; (3) two or three times a week ; (4) once a week ; or (5) seldom. Based on these questions, we constructed a scale that indicates the level of a couple's involvement in housework. More specifically, we first scored 5 if a respondent's husband participated in each item of housework most frequently. In contrast, where a husband did domestic chores least frequently, his involvement was valued at 1. Subsequently, we computed z-scores for the values a husband earned for these questions, and summed them up. This was termed a 'husband's housework performance (HHP) score' and regarded as an indicator of his participation in domestic chores. We calculated the score of wives' participation in domestic work in the same manner, and term it a 'wife's housework performance (WHP) score'. Finally, dividing the HHP by the WHP scores, we obtained the ratio of housework performance between a husband and wife (Gender Equity Score). According to the gender equity score, the level of gender equity was divided into two : (1) equal ; and (2) unequal. The 'equal' group was made up of respondents whose scores stood above one third from the top. Respondents whose scores fell below the top one third of the whole belonged to the 'unequal' group.

Admittedly, the gender equity score may vary with the duration of marriage. For instance, the arrival of a new baby may require a husband's more active involvement in domestic work and increase his share of it. This being the case, the effect of gender equity will not be appropriately investigated by our gender equity score. At the same time, however, there are also good reasons for thinking that a gender division of housework remains almost constant throughout marriage life. For instance, Kooreman and Kapteyn (1987) find that the presence of children does not exert an impact on the amount of time husbands spend on domestic activities. Also, Tsuya (2000) shows that, in Japan, the share of time for housework between a father and

mother hardly varies with the age of their last child. In fact, the gender equity score has a negligibly weak correlation to the duration of marriage for our sample ($r=-0.10$), and thus the former is hardly dependent on the latter. Taking this point into consideration, we will, in the present study, first analyse all women, and thereafter those who had been married for less than 14 years. This procedure allows us to obtain insight in the bias resulting from the analysis of all married women instead of only those who married recently.

As discussed in the previous section, a more egalitarian sharing of housework allows his wife to combine employment and childcare more easily. Thus, great gender equity in household may encourage childbearing and hasten the entry into motherhood. Nevertheless, because of a 'younger age at finish' effect (Ní Bhrolcháin, 1986), it is likely that the unequal share of housework leads to the compression of birth intervals. More specifically, if household chores are concentrated on a wife, she may attempt to make an early start and finish in childbearing, and resume labour force participation at relatively younger ages. This will allow her to fulfil dual responsibility in home and workplace. By contrast, where domestic tasks are equally shared between a husband and wife, she will not need to give birth at the early stage of her life. As such, we cannot determine the effect that gender equity has on the timing of motherhood *a priori*.

Thirdly our model included a covariate which indicated women's attachment to the labour market. As has been already mentioned, wives' educational attainment and husbands' participation in housework appear to play a crucial role be in determining the timing of childbearing. However, the influence which these factors have on fertility behaviour varies depending on the extent to which women are committed to the labour market. For instance, if a woman quits her job after marriage and never returns to the labour market, her fertility behaviour will hardly be affected by her earning potential and

husband's participation in household chores. In contrast, these two factors will have a strong impact on women's fertility behaviour if they continue to work after bearing children. In order to examine the effect of wives' attachment to the labour market, our analysis included a covariate regarding their employment. We classified women into three groups according to their employment history, and utilised these groups as categorical variables. The first group was composed of women who continued to work after marriage, while the second consisted of those who quit their job after marriage. Women who had not have worked before marriage belonged to the third group.

Fourthly, we put an attitudinal covariate in our model. It is established that ideational factors have caused changes in the demographic patterns of industrialised countries (Lesthaeghe, 1995 ; Van de Kaa, 1987). According to the Second Demographic Transition theory, albeit with various terms used, the spread of more individualistic and less traditional attitudes leads to the postponement or avoidance of parenthood. Since NFRJ 98 had questions to ask about respondents' views[1] on family relations, they were used to examine the effects of ideational factors on the first childbearing. In concrete terms, we first assigned numeric values to four ordinal answering categories of each question. In our scoring method, the more traditional and less self-centred a woman's attitude to the family, the higher the numerical value her answer received. Subsequently, the numerical values a respondent received for each answer were transformed into z-scores. Thereafter, we summed up these standardized scores for each respondent, and regarded this total as her attitudinal score. Lastly, the range between the highest and the lowest values of these attitudinal scores was divided in half. When a respondent's attitudinal score stood at the upper half of the range, she was classified as a member of the 'traditional' group. In contrast, if her score belonged to the lower half, she was categorised as part of the 'untraditional' group.

It should be bore in mind that, while one's attitudes and behaviour are linked to each other, it is quite difficult to determine which of the two is the cause of the other. One's attitudes may determine when to have a first child, but at the same time, becoming a mother may affect one's attitudes toward the family. In this study, we therefore refrain from drawing a definite conclusion on the causal relation between attitudes and fertility behaviour.

Fifthly, our model included one background and three demographic covariates as control variables : wife's father's occupational status ; wife's birth cohort ; marriage age ; and marriage age squared. The father's occupational status was classified into three categories : (1) a full-time employee with managerial status ; (2) a full-time employee without managerial status ; and (3) other (which consists of part-time employees, self-employed persons, farmers, lumbermen, and fishermen). With regard to the demographic covariates, the wife's birth cohort was dealt with as a categorical variable in our model, while the marriage age was treated as a continuous variable. In our analysis, actual age at marriage minus 15 was regarded as a woman's marriage age. Furthermore, female age at a demographic event may bear a curvilinear relation to the timing of her subsequent event. For example, Yamaguchi and Ferguson (1995) discovered that maternal age at first birth had a curvilinear effect on the timings of her second and third births. Taking account of this point, we included the quadratic term of wife's marriage age in our model.

In addition to the above fixed covariate, our model employed the calendar-year period as a time-dependent covariate in order to capture the effects of changes in the country's family-friendly policy and economic circumstances. Specifically, the calendar period was divided into three parts in such a way as to represent major developments in the family-friendly policy. The first part is the period until the year 1991, during which period parental leave was not guaranteed statutorily. The second part is the years from 1992 to 1994.

During this period, the Parental Leave Law (*Ikuji Kyugyo Ho*) was enacted. This law allowed working parents to take one year's parental leave off work to look after their children, although small firms with less than 30 employees were exempt from the application of this law. The third part was the period after the year 1995, when the Parental Leave Law was reformed. From this time, all firms, regardless of their number of employees, were expected to comply with this law. Furthermore, a 20 percent of wage compensation throughout the period of leave was legally guaranteed under this modification to the law. Parental leave programmes theoretically allow parents to combine employment and child rearing more easily, thereby encouraging women to enter motherhood. Hence, it is expected that, as family-friendly policies become more generous, the interval between marriage and the first childbearing will become shorter.

With regard to the country's economic circumstances, we employed three period dummy variables with a year lag to capture the influence of the upswings and downswings of the Japanese economy. More specifically, we classified calendar years into three levels according to the annual growth rate of GDP : the years with a rate of less than 2.0 percent (low), from 2.0 to 5.0 percent (medium), and of more than 5.0 percent (high). Since good economic circumstances should promote childbearing, higher intensities of the first birth event will be observed during periods of economic upswing. It should be noticed that, although period covariates of the similar type are used in previous studies (Hoem, et al., 2001 ; Santow and Bracher, 2001), to what extent these variables can capture the effects of changes in governmental policies and economic situations remain an open question.

The time-independent covariates included in our model and the basic statistics of our sample are presented in Table 1.

Table 1 The time-independent covariates and the sample characteristics

Covariate	N	% of women having a first child	Median month between marriage and first birth
Birth cohort:			
-1950	183	97.3	14
1951-55	259	93.8	16
1956-60	205	92.2	15
1961-65	217	92.2	17
1966-	139	77.0	19
Wife's education:			
Junior or senior high school	539	92.0	15
2-year junior college	357	92.2	16
University or higher	107	86.0	20
Employment history:			
Continue after marriage	547	89.0	18
Quit after marriage	389	93.8	14
Not working before marriage	67	97.0	12
Attitudes toward the family:			
Untraditional	639	89.9	17
Traditional	364	94.2	14
Father's occupational status:			
Full-time employee with managerial status	235	92.3	17
Full-time employee without managerial status	429	88.8	16
Others	339	94.1	14
Gender Equity:			
Unequal	668	94.3	15
Equal	335	85.7	18
Total:	1003	91.4	16

Source: Own calculation based on the National Family Research Survey.

Results of Event History Analysis

(1) Main Effect

Table 2 displays the results of our analysis for all married women. The covariate serving as the indicator of gender equity is excluded in Model 1, while all covariates described in the previous section are included in Model 2.

As might be expected, the level of women's education had a negative effect

on their first childbearing. Although a significant difference cannot be seen between the 'Junior or senior high school' and the '2-year junior college' groups in Model 1, the 'University or higher' group showed a considerably low hazard rate of first birth. When compared with women who terminated their education at the junior or senior high school, women with university degrees yielded a 27 percent smaller risk of first childbearing. This evidence suggests that women with a great earning capacity tend to postpone their first birth from marriage. Theses results are partly in accordance with the New Home Economic theory.

With regard to wives' attachment to the labour market, their employment history had a significant effect on the intensity of first birth. In particular, a drastic decline in the hazard rate was observed for women who continued to work after marriage. They showed a 35 percent lower risk of bearing a first child in comparison with women who did not work before marriage. In contrast, there was a mild and statistically insignificant difference in the hazard rate between women who quit their job after marriage and did not work before marriage. It follows that women's continuous attachment to labour market participation plays a crucial role in the tempo of their entry to motherhood. Since governmental support for working mothers is not particularly generous in Japan (Gauthier, 1996), it is difficult for them to be engaged in gainful employment outside the home. Owing to the difficulty of combining work and childcare, women with a continuous commitment to their career may have reduced the probability of first childbearing significantly.

The attitudinal covariate had a powerful impact on the timing of first birth. Wives with traditional attitudes toward the family yielded a 22 percent higher risk of bearing a first child than those with untraditional attitudes. This implies that the latter tend to become mothers at a later stage in life than the former. Moreover, the hazard rate was significant at the 1 percent level. As

Table 2 Relative risks of first birth for Japanese women

Covariate	Model 1 exp(β)	Model 1 se(β)	Model 2 exp(β)	Model 2 se(β)
Marriage age	1.13***	0.05	1.14***	0.05
Marriage age squared	0.99***	0.00	0.99***	0.00
Birth cohort:				
-1950	1.17	0.11	1.18	0.11
1951-55	1.03	1.10	1.02	1.10
(1956-60)	1.00		1.00	
1961-65	1.05	0.11	1.05	0.11
1966-	0.94	0.17	0.93	0.17
Wife's education:				
(Junior or senior high school)	1.00		1.00	
2-year junior college	0.97	0.07	0.97	0.07
University or higher	0.73***	0.09	0.74***	0.09
Employment history:				
Continue after marriage	0.65***	0.09	0.66***	0.09
Quit after marriage	0.86	0.12	0.87	0.12
(Not working before marriage)	1.00		1.00	
Attitudes toward the family:				
(Untraditional)	1.00		1.00	
Traditional	1.22***	0.09	1.19***	0.08
Father's occupational status:				
(Full-time employee with managerial status)	1.00		1.00	
Full-time employee without managerial status	0.89	0.08	0.89	0.08
Other	1.04	0.10	1.03	0.10
Family-friendly policies:				
(-1991)	1.00		1.00	
1992-1994	0.86	0.19	0.86	0.19
1995-	0.85	0.18	0.86	0.19
Economic growth rate (%):				
(<2.0)	1.00		1.00	
2.0-5.0	1.07	0.16	1.06	0.16
5.0<	1.18	0.19	1.17	0.19
Gender equity:				
(Unequal)			1.00	
Equal			0.82***	0.06
log-likelihood	-5563.6		-5560.0	
N	1003		1003	

*** Significant at the 0.01 level or better. ** Significant at the 0.05 level.
*Significant at the 0.10 level.
Parentheses are the baseline category.
Source: Own calculation based on the National Family Research Survey.

mentioned before, it has been argued that ideational factors are associated with a delay in the timing of childbirth in Europe. The present results suggest that this relation is also seen in Japan.

As far as the background characteristics are concerned, a U-shaped relation was observed between fathers' occupational status and first-birth intensity. Among the three categories, first-birth intensities were lowest for daughters of fathers who had been full-time employees without managerial status, whereas women whose fathers had been either of full-time employees with managerial status or other occupational status showed a greater hazard rate. Nevertheless, since the hazard rates are statistically insignificant, this background factor does not affect first-birth intensities.

With regard to the demographic covariates, both the linear term and the quadratic term of marriage age exerted a statistically significant effect on first-birth intensities. It therefore follows that the timing of marriage has a curvilinear relation to that of first birth. On the other hand, the effect of birth cohorts corresponds, in broad terms, to the upward trend in a mother's age at first birth, as seen in Fig. 1. As cohorts became younger, the timings of their first births were delayed.

As for the time-varying covariates, the indicator of the national economic situation revealed an expected relation with first-birth intensities. The hazard rate of first birth rose in tandem with an increase in the annual economic growth rate, although no statistical insignificance was identified for the categories of this variable. It therefore follows that annual economic circumstances bear little influence on women's entry to motherhood. Likewise, we did not detect a significant effect of the development of family-friendly policies on first birth intensities. This result is probably related to the fact that a considerable number of women had not taken advantage of this programme, even after the Parental Leave Law was enacted in 1992. Indeed, in 1999, the take-up rate of

parental leave was, on the average, only 56.4 percent of employees who or whose partner gave birth during that year (Ministry of Labour, 1999). The rate was particularly low in small firms with less than 100 employees. Hence, the development of the policy may have yielded no significant hazard rate in our model, although this type of period covariate has difficulty capturing the impact of family-friendly policy on fertility behaviour properly.

Subsequently, we will examine the effect of gender equity on the timing of first birth. According of the results of Model 2, the equal sharing of domestic work between a husband and wife reduced the intensities of first birth. Specifically, compared with wives in the 'unequal' group, those in the 'equal' group were about 20 percent greater with reference to the hazard rate of first birth. This evidence implies that a low level of gender equity within the family has the 'younger age at finish' effect, and thereby tend to hasten the tempo of first childbearing after marriage. As has been already discussed, where a wife is a primary performer of housework, early childbearing after marriage seems to be a good strategy for her. The reason for this is that she can return to work at a younger age and relieve difficulties in combining employment and childrearing. However, this accelerating family formation strategy is likely to became less necessary in an egalitarian family, since a greater level of gender equity relieves domestic burden for wives and makes motherhood and employment more compatible even at a relatively old age. Consequently, the tempo of childbearing will decrease in a gender-equal household.

Now, let us turn to the analysis of recently married women. Model 3 in Table 3 is constructed for women who had been married for less than 14 years. Since relatively elderly women are excluded in this analysis, birth cohorts are re-categorized into two in Model 3. First of all, key covariates on first birth intensities have quite similar effects in Model 2 and Model 3. Compared with women in the 'Junior or senior high school' category, the hazard rate was 4

Table 3 Relative risks of first birth for recently married women

Covariate	Model 3 exp(β)	se(β)
Marriage age	1.26**	0.12
Marriage age squared	0.99***	0.00
Birth cohort:		
(-1964)	1.00	
1965-	0.81	0.14
Wife's education:		
(Junior or senior high school)	1.00	
2-year junior college	0.96	0.12
University or higher	0.69**	0.13
Employment history:		
Continue after marriage	0.37***	0.12
Quit after marriage	0.41***	0.13
(Not working before marriage)	1.00	
Attitudes toward the family:		
(Untraditional)	1.00	
Traditional	1.31***	0.15
Father's occupational status:		
(Full-time employee with managerial status)	1.00	
Full-time employee without managerial status	0.94	0.13
Other	0.93	0.15
Family-friendly policies:		
(-1991)	1.00	
1992-1994	0.82	0.26
1995-	0.80	0.24
Economic growth rate (%):		
(<2.0)	1.00	
2.0-5.0	1.07	0.32
5.0<	1.08	0.28
Gender equity:		
(Unequal)	1.00	
Equal	0.71***	0.09
log-likelihood	-1667.9	
N	386	

*** Significant at the 0.01 level or better.
** Significant at the 0.05 level. *Significant at the 0.10 level.
Parentheses are the baseline category.
Source: Own calculation based on the National Family Research Survey.

percent lower for those the '2-year junior college' category and 31 percent lower for those with university degrees. These patterns of influence were the same as those in Model 2. Likewise, the level of gender equity bad a similar impact on childbirth, yielding a 30 percent lower risk for the 'equal' group than the 'unequal' group. It can be argued from the evidence that no serious distortion exists between the analyses of all marriages and recent marriages.

(2) Interaction Effect

It was observed in the previous analysis that women's education had a negative effect on the entry into motherhood. It is, however, likely that this effect varies across the levels of gender equity, for the compatibility between childrearing and extra-familial activities depends on to what extent a mother needs to devote herself to family responsibilities. For instance, if the egalitarian sharing of housework within a family reduces the time and energy a mother spends bringing up children, her educational level may have a weak negative impact on the timing of her first childbirth.

To test this hypothesis, Model 4 includes the interaction term between gender equity and wife's education, and excluded the covariates without any significant coefficients in Model 2. A negative and significant interaction effect was observed in Model 4 and indicates that the relation between women's educational levels and their risk of bearing a first child varies between the 'unequal' and the 'equal' groups (see Table 4).

In order to discuss this point in detail, we calculated the relative risk of first birth by the level of gender equity, based on the results of Model 4 (see Fig. 2). Overall, better-educated women tend to yield a smaller risk of having a firs child. The noteworthy point is that the 'high' gender equity group showed a greater gradient of first-birth intensity between wife's educational levels than the 'low' equity group. More specifically, in households where

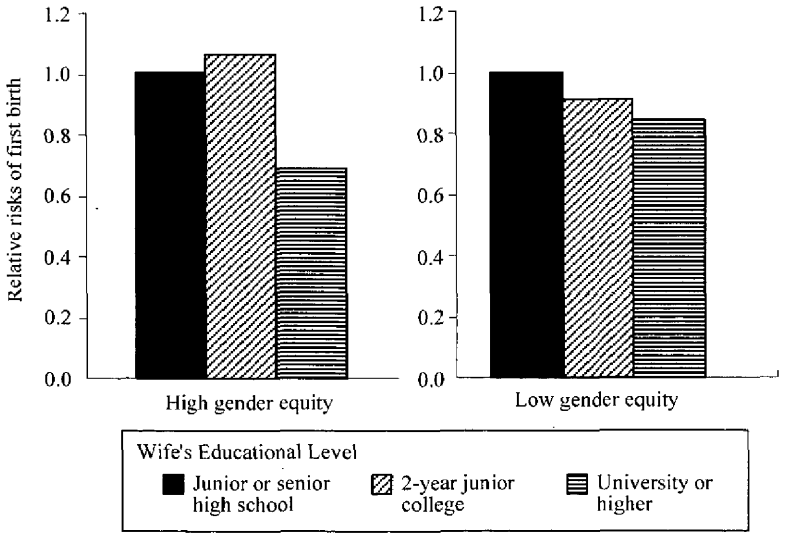
Table 4 Relative risks of first birth (including the interaction term)

Covariate	Model 4 β	se(β)
Marriage age	0.12***	0.05
Marriage age squared	-0.01***	0.00
Birth cohort:		
(-1950)		
1951-55	-0.16*	0.09
1956-60	-0.18*	0.09
1961-65	-0.17*	0.09
1966-	-0.43**	0.08
Wife's education:		
Junior or senior high school	0.37*	0.30
2-year junior college	0.50**	0.34
(University or higher)		
Employment history:		
(Continue after marriage)		
Quit after marriage	0.27***	0.09
Not working before marriage	0.45***	0.21
Attitudes toward the family:		
(Untraditional)		
Traditional	0.16**	0.08
Gender equity:		
Unequal	0.46**	0.35
(Equal)		
Wife's education × Gender equity:		
Junior or senior high school × Unequal	-0.21	0.39
2-year junior college × Unequal	-0.42*	0.09
(University or higher × Unequal)		
log-likelihood	-5657.26	
N	1003	

*** Significant at the 0.01 level or better. ** Significant at the 0.05 level.
*Significant at the 0.10 level.
Parentheses are the baseline category.
Source: Own calculation based on the National Family Research Survey.

domestic chores were shared by the husband and wife unequally, the risk of bearing a first child was 16 percent lower for wives in the 'University or higher' group than those in the 'Junior or senior high school' group. By contrast, in households with the egalitarian gender division of housework, wives in the

'University or higher' category yielded a 31 percent lower risk of having their first child than those in the 'Junior or senior high school' category. Hence, it can be argued that the association between women's education and the tempo of first birth considerably depends on contextual factors within a family. As the gender equity between a husband and wife becomes greater, her educational attainment tends to have a stronger impact on the timing of first childbearing after marriage. This result may be derived from the cultural settings of Japan. In Japanese society, great importance is attached to having children as the purpose of marriage, and looking after children is regarded as the primary role of married women (Brinton, 1992 ; Coleman, 1983 ; Morgan, et al., 1984). Accordingly, if a husband is not an active participant in housework and the level of gender equity within a family is low, his wife will have to give precedence to child rearing regardless of her earning potential. In this case, his



Source: Own calculation.

Fig. 2 Interaction between wife's education and gender equity

wife's educational attainment will have a relatively weak impact on the timing of childbirth. In contrast, where husbands are actively involved in domestic work, wives will make a decision as to when to have a child, with their education and earning potential in the labour market taken into consideration. To borrow Ariès' phrase, a 'child-king' is still on the throne in Japanese families (Ariès, 1980).

Conclusion

Female educational attainment has been regarded as one of the driving forces behind fertility changes in industrialized countries. Owing to an enhancement in their earning potential in the labour market, women's greater educational attainment leads, in theory, to a delay or an avoidance of motherhood. On the empirical side, this hypothesis is not always supported and the influence of female education varies across countries. Although these variations have been accounted for by external factors impacting on families, little attention has not been paid to internal factors within families themselves.

The main purpose of this study was to investigate the influence of gender equity within the family on Japanese childbearing behaviour by using the survey data. More specifically, we examined whether or not the relation between women's educational attainment and the timing of their first birth after marriage is affected by the sharing of housework between a husband and wife.

The findings of the present study, firstly, suggest that gender equity within a family have a negative impact on the tempo of first childbearing. Specifically, a more egalitarian share of housework postponed wives' entry into motherhood. This result is probably derived from the fact that the equal sharing of domestic chores allows wives to combine employment and childrearing at a relatively later stage of her life.

The findings of the study, in the second place, indicate that the influence of female education on childbearing behaviour varies according to the level of gender equity within a family. To be specific, in households with the egalitarian gender division of housework, their wife's educational level affected the timing of first childbearing strongly. In contrast, where domestic work concentrates on wives, their educational levels had a weak influence on the timing of their first birth. It is pointed out that, in Japanese families, bearing and rearing children tend to be regarded as the primary role of married women. Because of this, if housework is biased towards wives, they will give precedence to family responsibilities regardless of her educational credential. Consequently, female educational attainment may have produced a relatively weak impact on childbearing behaviour in wives of less egalitarian families.

From a perspective of international comparison, the results of this study may be limited to Japan. Although the present analysis identified that the relation between female education and first childbearing depended on the gender division of domestic labour, this interaction is very likely related to cultural settings inherent in Japanese society. It therefore seems possible that the interaction between wives' education and gender equity within a family may vary in different cultural settings. With this point in view, more comparative studies on the impact of gender equity on fertility behaviour will be necessary.

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Notes

1. The statements used for these questions were as follows :

   (1) Men should work outside the home, and women should devote themselves to housework at home.

   (2) Parents should sacrifice their well being for the sake of children's happiness.

   (3) It is the eldest son's duty to look after his parents.

   (4) Children should co-reside with their aged parents when they are no longer able to take care of themselves.

   For each statement, a respondent was asked to choose one out of four responses ('agree completely', 'agree', 'disagree' and 'disagree strongly') that were most closely matched their views and opinions.

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