Sibling Configuration and Transition to First Marriage in Japan.

Suzumi Yasutake
The Johns Hopkins University
September 21, 2009

This paper analyzes the timing of first marriage in Japan by sibling configuration. I examine the entry into first marriage considering the type of marriage: arranged marriage and love marriage. This research is significant because Japanese people are delaying marriage or not marrying at all. Almost all childbearing happens among married couples in Japan, so marriage postponement or avoidance raises a concern in Japan about declining fertility and consequent depopulation and population aging.

Recent research on Japanese marriage incorporates Japan-specific aspects such as coresidence and women's hypergamy (Raymo and Iwasawa 2005). One aspect that is worthwhile examining is the Japanese family system, *ie. Ie,* assigns different responsibilities and authorities to siblings by birth order. The eldest sons or the eldest daughters among female-only sibship groups are assumed to take responsibilities of maintaining family lineage and caring for their elderly parents in exchange for inheriting the family wealth. The research on the timing of first marriage under *ie* system, however, has not been plentiful.

Further more, the role played by sibling configuration on the timing of marriage has not been conclusive. When scholars examine sibling configuration they do so in terms of the total number of siblings, birth order, and sex composition. In Japan, research on coresidence among married couples finds that the eldest sons and daughters are more likely to live with their parents compared to non-eldest sons and daughters (Kojima 1992,

NIPSSR 1983). Moreover, if women are not married to the eldest sons, they are more likely to live with their own parents (Martin and Tsuya 1991). This indicates not only that one's own sibling configuration influences one's life event, but that the sibling configuration of one's spouse also does.

The influence of sibling configuration on the timing of marriage, however, is not conclusive. One study found that having a large number of siblings delays marriage (Hodge and Ogawa 1986), whereas others found the opposite (Raymo 2003a, Raymo 2003, Kojima 1994). Some studies found that single people with different sex composition of siblings have different timing of marriage (Sakai 1992, Kojima 1994). For example, having older siblings of the same sex delays marriage of the youngest siblings of three (Sakai 1992). Regarding birth order, Ohtani found no influence of being the eldest sons on the timing of marriage (1989), but Kojima found that the eldest sons are less likely to marry compared to non-eldest sons (1994). These inconclusive results might be due to differences among samples, analytical methods, and control variables in a statistical model or the definitions of the sibling configuration. For example, one sample is of married couples with pre-school-age children from five cities (Hiroshima 1983), whereas the other is a nationally representative sample of married couples (Sakai 1992). Some only tested the number of siblings, but not birth order; and others tested birth order, but not with the number of siblings simultaneously. As a whole, existing research seems to imply that sibling configuration influences men and women differently, and being an heir might have some influence on the timing of marriage,

Japanese society experienced rapid social change after World War II including the changes in the industrial structures, where people started to have more opportunities for

upward mobility. People now have more access to higher education, and farming is not the main industry anymore. Legally, the Old Civil Code granted the family heir as a successor of family wealth with responsibility of maintaining family lineage and care of elderly parents. The New Civil Code, however, states the equal share of responsibility and wealth among siblings despite the fact that the main responsibility of care of elderly parents is still customarily on the family heir, especially wives of the eldest sons. With more access to the paid labor market and education, women have more power to choose the best future spouse, which means that they can avoid responsibilities of being a wife of the eldest son. In addition, although people still want to marry, their values and attitudes have changed. They are more acceptable to premarital sex, divorce and singlehood. In the old days, more people married through arranged marriage, but now it is through introduction by friends or siblings. With low fertility, the proportion of family heir is larger, which makes the market tighter for the heir because single people might want to avoid a family heir—avoiding responsibilities.

Research Questions and Hypotheses

I asked two questions in this paper.

1) Does sibling configuration influence the age of the first marriage?
2) Does the influence of sibling configuration on the first marriage change over time?

To answer these questions, I examined the following hypotheses.

Hypothesis 1a. The eldest sons marry later than the non-eldest sons.

1b. Among the eldest sons, the only-child eldest sons marry later than the non-only-child eldest sons.

Hypothesis 2a. The eldest daughters marry later than the non-eldest daughters.

2b. Among the eldest daughters, the only-child eldest daughters marry later compared to the non- only-child eldest daughters.

Hypothesis 3. Eldest sons in recent cohorts marry later than eldest sons in the older cohorts.

Hypothesis 4. In the recent cohort, the eldest daughters marry later compared to the eldest daughters in the older cohort.

Data and Method

The 11th NFS was conducted in Japan in 1997, and it comprises surveys of married couples and single persons. This survey, approved by the Japanese government, is part of an effort to collect data on marriage and fertility in Japan every five years (NIPSSR 1998).[1] The areas of sampling are selected based on the Kokumin Seikatsu Kisochosa (Comprehensive Survey of Living Condition of the People on Health and Welfare)[2] tracts and Census tracts, and the samples were selected randomly to be nationally representative. The questionnaires are constructed to cater to married couples and singles persons differently. The respondents in the married couple survey are wives between 18 and 49 years old, including those who are currently in first marriages or remarriages. This is a retrospective survey where respondents answer questions about their life history and that of their husbands'. The response rate was 94.0%. After excluding invalid questionnaires, the valid response was 8,148 (86.5%). Comparing to the Rodoryokuchosa[3], in general, the age distribution is consistent with the population, but married women in their 40s are slightly underrepresented, and those in their 30s and 20s are slightly overrepresented, which is unlikely to influence the analysis. Among the

[1] 13th National Fertility Survey was conducted in 2005 instead of 2007.
[2] Kokumin Seikatsu Kiso Chosa is a household survey to obtain basic information of Japanese conducted every 3 years.
[3] Rodoryoku Chosa is conducted every month nationwide for people over age 15 to obtain information on employment.

couples, 90.3% are couples in which both the husband and the wife are in their first marriage. The sample of the singles persons survey consists of currently non-married people, including the never-married, divorced and widowed from 18 to 49 years old (NIPSSR 1998). The response rate was 84.9%. After excluding invalid questionnaires, the valid response was 9,402 (74.9%). Single people under 20 years old are slightly underrepresented, and single people who are over 20 are slightly overrepresented compared to the Kokumin Seikatsu Kiso Chosa. These under- and overrepresentations are also not to the extent which will influence the analysis (ibid). Among the single persons, 7.6% (N=718) are ever-married.

This data set has many advantages. First of all, this is a national representative sample. It provides key information about the birth order, the number of siblings, sibling configuration of both married couples and single people, and the date and the type of marriage (arranged marriage or love marriage.) Another advantage is that the female respondents provided their coresidence history before marriage, type and status of occupation before marriage, and mother's work history[4], all of which are relevant to research on the timing of the first marriage in Japan. Additionally, this data set covers a wide range of people born between World War II and 1979 when Japan experienced rapid social changes. This age range allowed for the examination of the influence of social change on individual behaviors. Also, the youngest respondents were 18 years old, so it is unlikely that they would have an additional sibling after the date of the survey that would change their sibling configuration.

First this is a cross-sectional data, so it is impossible to distinguish age and cohort effects. That is to say, one's marriage might be influenced by aging or by one's cohort

[4] Father's occupation was not significant, so it is not included in the final analysis.

experience, such as the enactment of the Equal Opportunity Law to encourage women's labor participation. Second, both the couple questionnaire and single questionnaire have marital history questions, but the dates of the first marriage for those who are remarried, widowed or divorced are not asked in questionnaires. If their marital behaviors are different from those who are in the first marriage and never married, the estimation could be biased. Third, I have limited information on male married respondents. Fourth, there are some issues about information on sibling configuration. The number of siblings might have influenced by mortality of respondents' siblings and as well as the parents, and remarriage and divorce of their parents. Moreover, I cannot assertain whether the siblings are related by blood, remarriage or adoption.

Description of study samples

I constructed data sets by pooling married and single data sets together, and then separated them by sex. To make the age range compatible with women, I dropped married men whose age was out of the age range between 18 and 49 because the age range of married men was wider than married women. From these two base data sets, I created two sets of samples of men and women. The first sample consists of never-married and first-married men and women. The second one consists of men and women over 40 years old including the divorced and widowed.

I created a set of analytical samples of men and women based on the base data sets. This data consists of first-married and never-married men and first-married and never-married women. I restricted the sample of men and women to the never-married and first-married couples by deleting respondents who were divorced, widowed or remarried, and further, who have divorced or widowed spouses. I, then, dropped

respondents who are missing the information about the age of first marriage, the type of marriage for married people, and age. I created a person-year data set by reshaping the data so each married persons contribute one person year of observation until they marry. Or if they are never-married, they contribute one person year until the date of the survey. I dropped missing observations of heir status, respondents' education, respondents' current occupation and status.[5] The final number of the analytical data for men is 102,077 in person years and for women it is 103,347 in person years.

Analytical Strategies

I performed the Kaplan-Meier Estimator, two sets of discrete-time event history analysis, and logistic regression.

The Kaplan-Meier Estimator

After the descriptive analyses, I graphed the survival function of first marriage by family heir status by the Kaplan-Meier estimator. The Kaplan-Meier estimator is a nonparametric method for estimating the survival function.

$$(1)\ \hat{S}(t) = \prod_{j|t_j \le t} \left(\frac{n_j - d_j}{n_j} \right)$$

$\hat{S}(t)$ is the probability of survival from the first marriage after t. n_j is the number of individuals at risk, that is, never-married men or women, at time t_j; and d_i is the number of failures, that is, the number of individuals who married first time, at time t_j. The product is overall observed failure times less than or equal to t.

Discrete-Time Event History Analysis

[5] The per cent of missing observations of these are very small. The preliminary analysis showed that they were not significant.By dropping them, the sizes and significance of the coefficients did not change.

Discrete-time event history analysis is a form of event history analysis. Event history analysis is suitable when: 1) the outcome variable is the occurrence of an event over time (marriage); 2) there is a right censoring problem, that is, one might be never married at the time of the survey. ; and 3) how much time elapses until the event occurs is of interest in addition to whether the event even occurs (Yamaguchi 1991). Discrete-time event history analysis is particularly suitable when the time units are large (Allison 1984). "When the time units are large—months, years, or decades—it is more appropriate to use discrete-time methods"(Allison 1984: 14.) This model approximates continuous-time models (Yamaguchi 1991.) In addition, this model allows including time varying covariates with ease (Allison 1984.)

Another advantage of the model is that it allowed me to change the hazard by "letting intercept be different at each point in discrete time" (Allison 1984:18.) It is reasonable to assume that the hazard of the first marriage varies by age. The maximum likelihood estimation is used. The first outcome variable is the timing of first marriage: married first or never married. "The discrete-time logit model is defined using the concept of a logit, or log-odds." (Yamaguchi 1992:18) We can use a logistic regression programs for estimating parameters"(Yamaguchi 1992:19.) The coefficients βs give the change in the log odds.

Discrete Time Event History Analysis with Competing Risks

The second set of analysis employed the categorical variable as an outcome: never married, arranged marriage, and love marriage. Competing risk is defined by "the occurrence of one eent type removes the individuals from risk of the other event type." (Allison 1984: 43) "Competing events are different events that can occur within the same

risk period. (Yamaguchi 1991: 169.) In each case, the occurrence of an event implies the termination of the risk period for the other event. (Yamaguchi 1991:169.) That is, if one married by arranged marriage, this person is no longer at the risk of love marriage and vice versa. "The methods already discussed for single kinds of events can also be used with multiple kinds of events." (Allison 1984.)

Variables

Covariates in these studies vary by the studies and sex. The 11th NFS contains less information of married men than married women and single persons. Thus, the sample of men only has education, age and cohort as control variables. Women have additional control variables: the type of occupation, occupational status, mother's work history, coresidence with parents.

Dependent variables: Timing of Marriage

The dependent variable for Study 1 and Study 2 is the age of the first marriage. One set is never-married and first married. The latter is the reference category. The other set is never-married, arranged marriage and love marriage. The reference category varies by the model for the discrete-time event history analysis with competing risks.

Key Independent Variables

Family Heir

I created two sets of family heir variables. One consists of family heir and non-family heir. The other consists of only child, eldest son or daughter and others (non-family heir.) "Non-family heir" is a reference category.

Birth Cohorts

To capture the change in the influence of sibling configuration over time, I constructed a dichotomous variable by respondents' date of birth. I defined it as follows: birth cohort from 1946 to 1958; birth cohort from 1959 to1979. The first birth cohort was born after World War II and before the economic boom; the second birth cohort was born during the economic boom. The reference category is "birth cohort of 1946 to 1958."

Control Variables

As I mentioned previously, the men only has age, education and birth cohort variables. Other variables are considered only in female models.

Age

Age is included as a set if dummy variables for Study 1and 2

Education

I included a set of dummy variables to indicate different levels of education; "junior high school," "senior high school," "senior high school and more," and "four year college and beyond. "Senior high school" is a reference category.

Types of Occupation

Based on the exploratory analysis, I categorized as "farmers, business owners and factory workers," "professionals and managers," and "administrative workers", "services" and "not working." "Administrative workers" is a reference category.[6]

Occupational Status

I created a set of dummy variables: full-time workers, self-employed, non-full-time workers, unemployed workers.[7] Self-employed workers included self-employed or

[6] The categories in the survey were; farmers, business owners, professionals, managers, administratives, service and retails, factory workers, not working and students.

workers of a family business, moonlighting. The reference category is “full-time workers."

Mother’s Employment History

The survey provided mother’s employment history.[8] From this information, I created a set of dummy variables: “working mothers,” “stay-home mothers,” “mothers with other employment pattern than working full time or stay home.” “Working mother” is a reference category. I included a dummy variable of missing observations because it was significant.

Coresidence

Study 1 and 2 included coresidence variable. The survey asked about coresidence before marriage. This question asked the respondents to choose whether they lived with their father and/or mother before marriage (for married women) and were currently living for single persons and their parents’ mortality status. Based on this information, I constructed a set of dummy variables: Living with two parents, living with one parents, but other parents alive, living independently with both parents alive, living independently with one parent deceased, both parents deceased. Coresidence with both parents is a reference category. I included a dummy variable of missing observations because it was significant.

Results

The Timing of the First Marriage: Study 1 and Study 2

---

[7] The survey asked whether one is full-time worker, part-time, self-employed or working for a family business, naishoku (moonlighting), unemployed or housework, student and others. Based on the preliminary analysis, I created a set of dummy variables above.

[8]

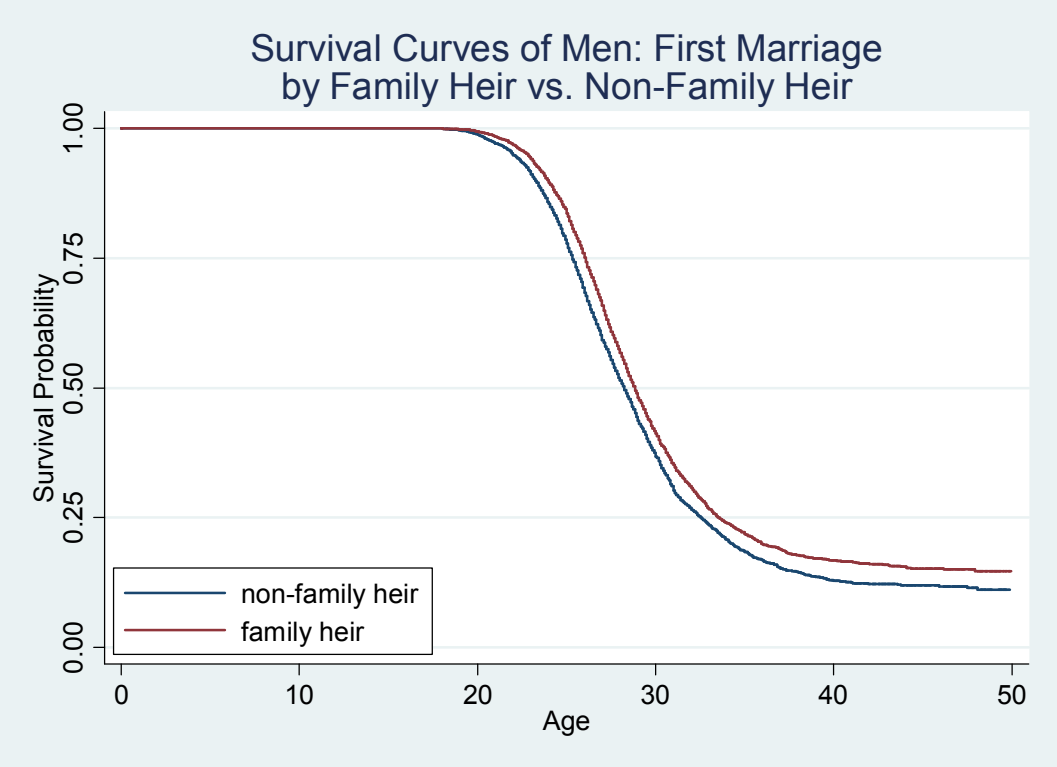
Table 1 shows the distribution of analytical samples for the event history analysis in person-years by sex. Five point seventy-one men and 6.55 per cent women are married. Among them, 1.12 per cent men and 1.5 per cent women married by arranged marriage, and 4.59 per cent men and 5.05 per cent women are married by love marriage. Sixty-four point seven per cent men and 19.9 per cent women are family heirs. Six point sixty-one per cent men and six point forty-eight per cent women are the only child. Almost half of men are younger than age 22 and seventy percent women are. Almost half of men have education beyond senior high school as opposed to close to 40% women. Compared to female sample, male sample has a higher proportion of older cohort. Twelve point twenty-one per cent women worked as professional or manager before marriage. Close to 50% women worked as full time before marriage. Forty-four point eighty-six women have full-time work mothers. Fifty-nine point eighty-three women lived with both parents before marriage as whereas 20% of women lived independently before marriage.

The bivariate analysis found that, for both men and women, there are significant associations between family heir status and the probability of first marriage, suggesting non-family heirs might have higher probability of the first marriage compared to family heirs. Furthermore, it suggests that there might be an interaction between heir status and birth cohort on the probability of marriage, especially for the recent birth cohorts as well.

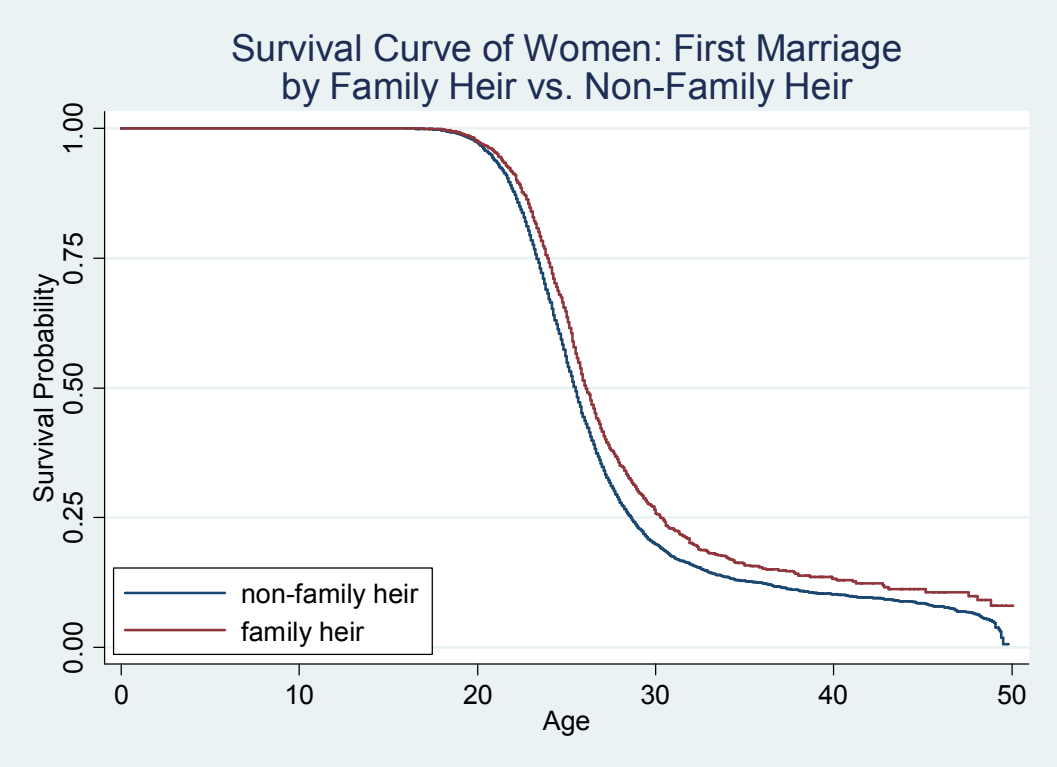
Kaplan-Meier Estimator

Graph 1 to 4 show the probability of first marriage by family heir status by Kaplan-Meier Estimator.

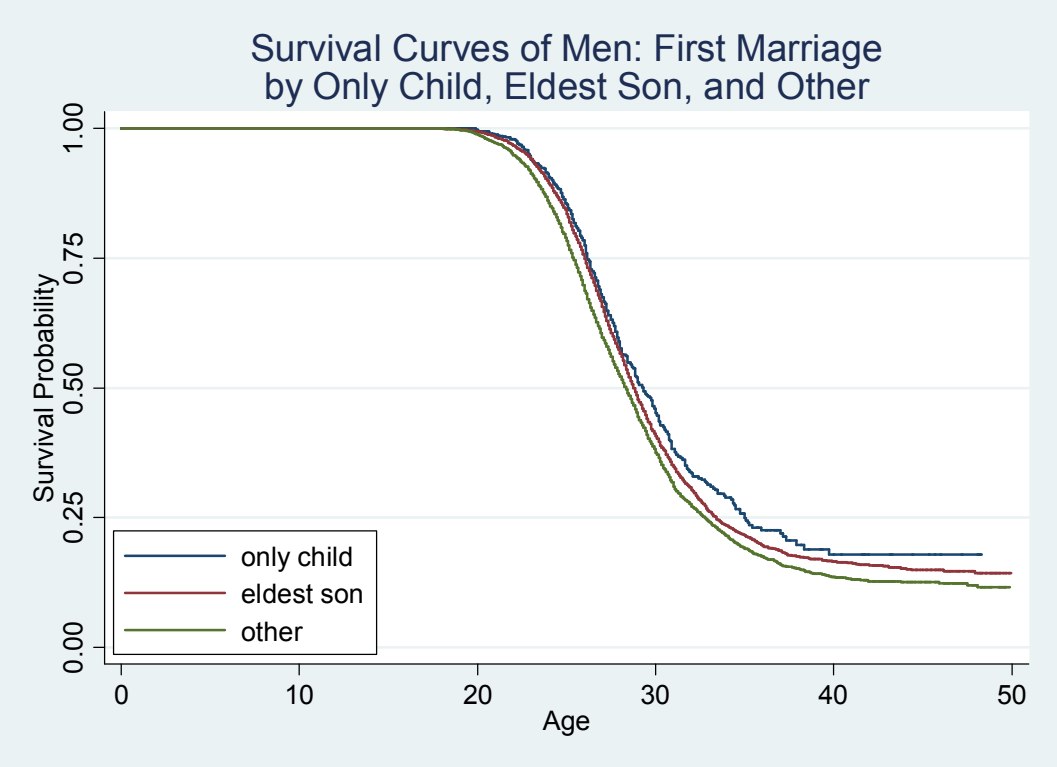
Graph 1.


Survival Curves of Men: First Marriage
by Family Heir vs. Non-Family Heir
Survival Probability
0.00
0.25
0.50
0.75
1.00
0
10
20
30
40
50
Age
non-family heir
family heir

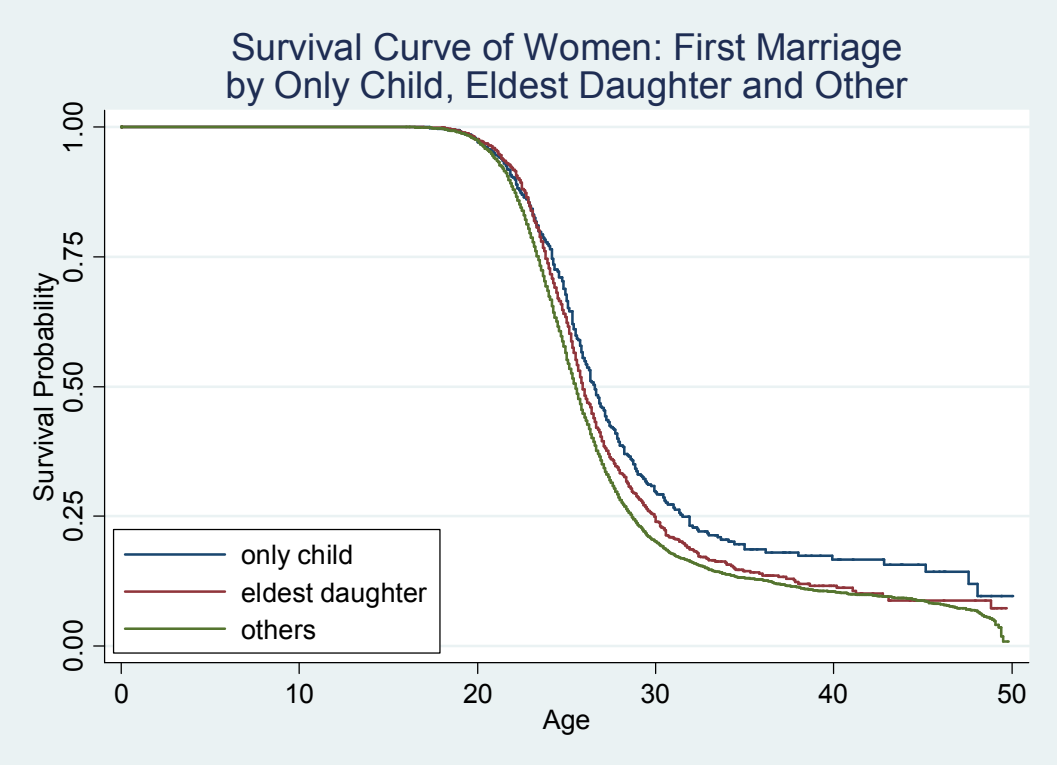
Graph 2.


Survival Curve of Women: First Marriage
by Family Heir vs. Non-Family Heir
Survival Probability
0.00
0.25
0.50
0.75
1.00
0
10
20
30
40
50
Age
non-family heir
family heir

Graph 3.


Survival Curves of Men: First Marriage
by Only Child, Eldest Son, and Other
Survival Probability
0.00
0.25
0.50
0.75
1.00
0
10
20
30
40
50
Age
only child
eldest son
other

Graph 4.


Survival Curve of Women: First Marriage
by Only Child, Eldest Daughter and Other
Survival Probability
0.00
0.25
0.50
0.75
1.00
0
10
20
30
40
50
Age
only child
eldest daughter
others

Overall women enter the first marriage at younger age and faster compared to men. Non-family heirs marry faster than family heirs regardless of sex, and the difference does not narrow as they age. Among family heirs, male and female only children enter into the first marriage later and at a slower rate compared to others. The delayed marriage of female only-child is more distinct.

The analyses without control variables suggest that family heirs might delay marriage, and, among them, the only children marry the latest and less.

Table 2 and 3 show the results of the discrete-time event history analysis in the log odds for men and women, separately. I ran two sets of models with two kinds of family heir variables. The upper panel of Table 2 presents the coefficients of models with dichotomous family heir variables and other independent variables. The lower panel shows the coefficients of a categorical family heir variable: only child, eldest sons and others. For male analyses, Model 1 includes only family heir variable. Model 2 includes an additional age variables. Model 3 includes additional education variables. Model 4 includes additional cohort variable. Finally, Model 5 includes an interaction term with family heir variable and birth cohort. For women, Model 1 includes only family heir status. Model 2 includes additional age variables. Model 3 includes additional education variables. Model 4 includes additional type of occupation variables. Model 5 includes additional occupational status variable. Model 6 includes additional mother's work history variables. Model 7 includes additional coresidency variables. Model 8 includes additional birth cohort variable. The interaction term was not significant. Other tables in

this chapter follow the same analytical strategies. Reference categories are shown in parentheses.

The upper panel of Table 2 presents the risk of first marriage in the log odds of men. Overall, male family heirs are less likely to marry compared to non-family heir men. The coefficients of family heirs in models are rather stable even with additional control variables. Net of covariates in Model 4, the odds of family heirs to enter the first marriage is 0.90 ((exp(-0.11), $p<0.001$) relative to non-heir men. The interaction term in Model 5 shows that the family heir in recent cohort are less likely to enter the first marriage by -0.13 in the log odds ($p<0.001$) compared to the old cohort.

The lower panel of Table 2 presents the results of an alternative family heir variable. Only sons and eldest sons significantly delay marriage. The unadjusted coefficients of only sons and eldest sons are -0.23 ($p<0.001$) and -0.15 ($p<0.001$) in the log odds. The coefficient for the eldest sons are rather stable compared to the only sons. Net of all covariates in the Model 4, the log odds of only sons is -0.18 ($p<0.01$) as opposed to -0.10 ($p<0.001$) of the eldest sons. That is, only sons marry 0.84 times (exp(-0.18)) and 0.9 times (exp(-0.10) compared to non-family heirs. The only sons are much less likely to marry compared to non-family heirs.[9] The interaction terms of Model 5 show that both only sons and eldest sons in recent cohorts are less likely to marry compared to the only sons and eldest sons in the old cohort (β=-0.17, $p<0.05$, β=-0.12, $p<0.001$, respectively.) The log likelihood ratio test shows that interaction terms improved the model fit.

The upper panel of Table 3 presents the results of women. Female family heirs significantly delay marriage compared to non-family, but age and cohort have

[9] The coefficients of only sons and eldest sons are significantly different.

confounding effects. The unadjusted coefficient of family heir is -0.30 in the log odds ($p<0.001$) in Model 1. Female family heirs are less likely to enter into first marriage compared to non-family heir women. Model 2 controls for age. The size of the coefficient of family heir was reduced by 0.1. From Model 3 to Model 7, the size of coefficients of family heir is rather stable. Controlling for birth cohort, however, reduced the size of the coefficient of family heir almost 1.5 times. The odds of family heirs to enter into the first marriage is 0.86 ((=exp(-0.15)) times relative to the non family heir women. The interaction term in Model 9 is not significant.

Model 1 in the lower panel of Table 3 shows the unadjusted coefficients of only-child women and eldest daughters are -0.22 ($p<0.001$) and -0.12 ($p<0.001$.) When I control for age, the sizes of both coefficients increased. Age suppressed the influence of the impact of only child and eldest daughters. The sizes of coefficients, however, are rather stable until I controlled for birth cohort in Model 9 for both. Net of all covariates in Model 8, the only-child daughters are less likely to marry compared to non-family heir daughters ($\beta=-0.18$, $p<0.01$.) The impact of being eldest daughters is no longer significant.

In sum, family heirs marry later than non-heirs and its effects are larger for women. The age seems to affect women more so than men. Among family heirs, only-child men and women are much less likely to marry compared to others, but eldest daughters are not significantly different from non-heir daughters net of all covariates. All family heir men, regardless of only child or eldest sons, recent cohorts are less likely to marry compared to the family-heir men in older birth cohort. The difference between cohorts might be more prominent for men compared to women.

Discrete-Time Event History Analysis with Competing Risks: Never Married, Arranged Marriage and First Marriage: Study 2:

Table 4 and Table 5 show the results of the discrete-time event history analysis with competing risks for men and women. Table 4a and 5a present the results of the log odds of marrying by arranged marriage relative to staying single. Table 4b and 5b present the log odds of marrying by love marriage relative to staying single. Table 4c and 5c present the log odds of marrying by arranged marriage relative to staying single. In each panel, the results with two types of family heir status are shown. The independent variables and the strategies are the same as previously mentioned.

Table 4a presents the log odds of the probability of arranged marriage relative to never married. Without any covariates, family heir men are less likely to enter arranged marriage relative to being single (β=-0.19, $p<0.001$). Similar to the logistic regression, the coefficients are rather stable in Model 2 and 3 controlling for age and education. With additional birth cohort variable in Model 4, however, the coefficient became no longer significant. The interaction term in Model 5 is not significant, either. Similarly, only-child men and eldest sons are less likely to marry by arranged marriage, but the significance disappeared with additional birth cohort variable. The interaction term in Model 5 is also not significant.

Table 4b presents the log odds of probability of the first marriage by love marriage relative to never married. The unadjusted coefficient of family heir is -0.15 in the log odds ($p<0.001$.) With all covariates in Model 4, the coefficient is still significant (β=-0.13, $p<0.001$.) The odds of first marriage by love for family heir is 0.88 (=exp(-0.13) compared to non-family heirs. The interaction term is not significant. The lower

panel of Table 4b shows that only child and eldest sons are much less likely to marry by love marriage compared to non-heir children in all models. Net of all covariates in Model 4, the odds of first marriage by love of only sons relative to non-family heirs is 0.84 (exp=(-0.18)) and the one of the eldest sons are 0.88 (exp=(-0.13).) The interaction term of only sons and birth cohort shows that only sons in recent birth cohort are less likely to marry than the ones in older birth cohort.

Table 4c presents the comparison between arranged marriage versus love marriage. The family heir variables are not significant.

Table 5a presents the odds of arranged marriage in the log odds relative to staying single for women. Family-heir women delay marriage compared to non-family heirs. Age and cohort reduced the influence of family heir status women as well. The unadjusted coefficient in Model 1 is -0.20 ($p<0.01$.) The odds of family-heir women to marry by arranged marriage relative to non-heir women is 0.81 (exp=(-0.20).) The coefficients are rather stable from Model 2 to Model 7. Net of covariates in Model 7, the odds of family-heir women to marry by arranged marriage relative to non-heir women is almost the same. Model 8 with a birth cohort variable took the significance of the family heir variable away. The coefficient is no longer significant. The lower part of the panel shows the results by an alternative family heir variable. Similar to the previous results, the significance of only daughters and the eldest daughters disappeared with an additional birth cohort variable in Model 8.

Table 5b presents the log odds of love marriage relative to staying single. The coefficient of family heir is -0.14 in the log odds ($p<0.001$.) The significance and magnitudes of the coefficients stayed rather stable from Model 1 to Model 7. The birth

cohort variable reduced the size of coefficient to -0.10 ($p<0.01$) Model 8, however. The lower part of Table 5b shows the results by only daughters, eldest daughters and others. The coefficients of only daughters stay significant with a little fluctuation. Net of covariates in Model 8, the odds of love marriage relative to staying single is 0.83 (exp=(-0.19), $p<0.01$) relative to non-family daughters. The significance of eldest daughters disappeared when I control for birth cohort.

Table 5c shows the log odds of arranged marriage vs. love marriage. Non of the family heir is significant.

In sum, the results show that family heir status influence the entry of first marriage of both men and women even when I considered the type of marriage. Among them, only sons and daughters are at disadvantage, particularly, at love marriage. There is, however, no difference of the odds of arranged marriage and love marriage.

I checked IIA (Independence of Irrelevant Alternatives.) I concucted Wald test and it the three categories—staying single, arranged marriage and love marriage—are not to be combined.

Discussion

This paper examined the significance of sibling configuration on the timing of the first marriage under the Japanese family system called *ie.* My research found that family heir delayed marriage regardless of gender. Among them, the only child delay marriage significantly in particular. Hypothesis 1a, that *the eldest sons marry later than the non-eldest sons* and Hypothesis 2a, that *the eldest daughters marry later than the non-eldest daughters*, are supported. Family heir of both men and women are delay marriage. This delay is significant in love marriage, but not in arranged marriage. Hypothesis 3, that

eldest sons in recent cohorts marry later than eldest sons in the older cohort, is supported but not Hypothesis 4, that the *recent cohort, the eldest daughters marry later compared to the eldest daughters in the old cohort*. The difference among cohort is particularly pronounced for the only sons when we compared love marriage and never married. This research found disadvantages of family heir in the marriage market. When single people have more autonomy in choosing their spouse, it is rational to avoid a possible spouse with more burdens. In this case, family heirs are still expected to take care of their parents at some time after marriage. Especially women who married with family-heir sons are more likely to have to give up caring their parents. If it is the case that family heir men do not want to marry a female family heir, it could be possible that they do not want to succeed women's surname. As opposed to only-child sons and the eldest sons are both less likely to marry, only female only children delay marriage. If men are avoiding marriage with only daughters, this could be because men might feel more responsibilities of care of spouse's parents. Only daughters cannot share responsibilities with other siblings like the eldest daughters with siblings. Or only daughters do not want to marry because they know more about the future burden.

The examination by the type of marriage revealed an interesting trend. Family heirs are not at disadvantages in arranged marriage market, but are in fact at disadvantage in love marriage market. When people do not have a facilitator to meet a possible spouse, sorting mechanism of possible mate became more obvious.

Interestingly, difference between cohorts is only seen among men. This could support that women have more autonomy and means to support themselves, so they are avoiding the family heirs. Or family heir men still feel more responsibilities to their

parents and such, but because the proportion of female family heirs has increased, they cannot find a good one sooner.

Other interesting findings are influence of age. Women marry faster than men. In addition, different background has different influence on arranged marriage and love marriage. For example, junior high school graduates are less likely to marry by arranged marriage compared to senior high school graduates, but more likely to marry by love marriage for men. Coresidence with parents has significant influence on the timing of first marriage for women. Women living with both parents are more likely to marry by arranged marriage, but women with both parents alive are not different in the probability of love marriage. It seems that parental mortality plays an important role for women. People might think that these women without two parents have fewer resources after marriage. For example, it is common that pregnant women return their parents' to have a child. If they do not, they cannot expect support from their parents, which are one of the determinants of having a child.

My study has various limitations. First, as I wrote in the previous section, the 11th NFS is cross-sectional data. Other possibility of biased estimations is the omission of the survey respondents who are in remarriage, widowed or divorced because the survey did not ask the date of the first marriage for those. If their mate selection and marriage behaviors are significantly different from who are in the first marriage, then this might also have biased the estimation of the coefficients. The scarcity of male background is another limitation. The analyses of women show the relationship between their family background and the timing of the first marriage is significant. It would have been more informative if men's family background is available. Lastly, I did not test the population

composition change of sibling configuration directly, but this could be considered in the future research by decomposition.

Despite the limitations of the data, this study significantly contributes the understanding of the timing of the first marriage in Japan. My study shows not only that sibling configuration is important, but that it differs between men and women in the light of the larger picture, and also that tradition still guides people's behavior in contemporary Japanese society. The differential results of men and women show the importance of analysis on both sexes. This research also demonstrates the influence on sibling configuration has been happening at a different pace for men and women. Coexistence of modern and traditional might give a twist to mate selection. This twist might make the effective public policies to reverse low fertility more difficult to implement. For now, the Japanese government has implemented incentives for married couples to have children by providing family-friendly working environment as well as cash incentives. However, if the issue of low fertility starts before marriage, the government policies targeting married couples might not be as efficient as they are intended to be. It would be interesting to see whether the recession in 1990s has influenced the timing of marriage, and whether young people marry to have economic stability disregarding family obligation or not.

Table 1
Destribution of Sample in Person-Years

	Men		Women	
	N	%	N	%
Type of Marriage				
Never Married	96,247	94.29	96,582	93.45
Arranged Marriage	1,144	1.12	1,546	1.5
Love Marriage	4,686	4.59	5,219	5.05

Heir Status				
Only Child	6,750	6.61	6,700	6.48
Eldest	58,657	57.46	13,870	13.42
Non Family Heir	36,670	35.92	82,777	80.1
Age				
Age -22	48,419	47.43	69,707	67.45
Age 23-28	32,817	32.15	23,341	22.59
Age 29-33	13,086	12.82	6,056	5.86
Age 33+	7,755	7.60	4,243	4.11
		100.00		
Education				
Junior high	9,576	9.38	5,147	4.98
Senior High	41,713	40.86	34,960	33.83
Some college	9,970	9.77	22,537	21.81
College Plus	24,225	23.73	7,407	7.17
Type of Occupation				
Farmers/business/factoryworkers	--	--	9,805	9.49
Professional /Manager	--	--	12,622	12.21
Administration	--	--	25,094	24.28
Service	--	--	13,335	12.9
Not Working	--	--	7,957	7.7
Occupational Status				
Full Time	--	--	47,015	45.49
Not Full Time	--	--	6,355	6.15
Self-Employed	--	--	2,630	2.54
Mothers' Work History				
Working	--	--	46,359	44.86
Stayhome	--	--	49,738	48.13
Some Work	--	--	2,309	2.23
Missing	--	--	4,941	4.78
			103,347	100
Coresidence				
Living with Both Parents	--	--	61,831	59.83
Live with One Parent	--	--	2,491	2.41
Independent	--	--	19,977	19.33
Independent with One Deceased Parent	--	--	12,496	12.09
Both Parents Deceased	--	--	1,522	1.47
Missing	--	--	5,030	4.87
Cohort				
1946 to 1959	47,189	46.23	40,699	39.38
1959 to 1969	54,888	53.77	62,648	60.62
Total	102,077	100.00	103,347	100

Table 2

Hazard of First Marriage: Men
Never Married vs. First Marriage by Family Heirs vs. Non-Family Heirs

First Marriage	Model1	Model2	Model3	Model4	Model5
Heir Status					
Family Heir	-0.16***	-0.15***	-0.15***	-0.11***	-0.12***
(Others)					
Age					
Age 23-28		2.07***	2.08***	2.05***	0.02
Age 29-33		2.57***	2.58***	2.53***	-0.73***
Age 33+		1.65***	1.67***	1.53***	-2.92***
(Age 18-22)					
Education					
Junior High			-0.13*	-0.19***	-0.91***
Senior High Plus			-0.16**	-0.10*	-0.26***
University Plus			-0.01	0	0.33***
(Senior High)					
Birth Cohort					
Birth Cohort after 1959				-0.35***	-1.98***
(Birth Cohrt before 1958)					
Interaction					
Family Heir*Birth Cohort after 1959					-0.13***
Constant	-2.71***	-4.29***	-4.27***	-4.10***	1.90***
N	102,077	102,077	102,077	102,077	102,077
Log Likelihood Ratio	-22334.14	-20146.68	-20138.47	-20066.75	-57099.61
Chi	48.98	3006.95	3057.49	3147.92	4079.82

Only Child, Eldest vs. Others

Only Child	-0.23***	-0.25***	-0.25***	-0.18**	-0.14*
Eldest Sons	-0.15***	-0.14***	-0.14***	-0.10***	-0.11***
(Others)					
Interaction					
Only Child*Birth Cohort after 1959					-0.17*
Eldest*Birth Cohort after 1959					-0.12***
Constant	-2.71***	-4.29***	-4.27***	-4.10***	1.90***
N	102,077	102,077	102,077	102,077	102,077
Log Likelihood Ratio	-22333.21	-20145.14	-20136.87	-20065.94	-57097.08
Chi	51.47	3009.4	3059.6	3149.87	4081.65

reference in ( )
legend +<0.10, * p<.05; ** p<.01; *** p<.001

Table 3

Hazard of First Marriage: Women
Never Married vs. First Marriage by Family Heirs vs. Non-Family Heirs

First Marriage	Model1	Model2	Model3	Model4	Model5	Model6	Model7	Model8
Heir Status								
Family Heir	-0.30***	-0.20***	-0.17***	-0.16***	-0.16***	-0.15***	-0.15***	-0.09**
(Others)								
Age								
Age 23-28		2.05***	2.12***	2.03***	2.04***	2.05***	2.06***	2.05***
Age 29-33		1.76***	1.82***	1.73***	1.76***	1.77***	1.83***	1.79***
Age 33+		0.71***	0.72***	0.63***	0.67***	0.69***	0.80***	0.57***
(Age 18-22)								
Education								
Junior High			0.46***	0.29***	0.30***	0.32***	0.36***	0.22**
Senior High Plus			-0.07*	-0.08*	-0.07*	-0.06+	-0.08*	-0.01
University Plus			-0.32***	-0.31***	-0.28***	-0.27***	-0.30***	-0.23***
(Senior High)								
Type of Occupation								
Farmers/business/factoryworkers				0.46***	0.55***	0.54***	0.54***	0.52***
Professional /Manager				0.23***	0.25***	0.24***	0.27***	0.26***
Service				0.33***	0.43***	0.42***	0.43***	0.44***
Not Working				-0.15*	-0.18**	-0.17**	-0.18**	-0.13*
(Administration)								
Occupational Status								
Not Full Time					-0.37***	-0.37***	-0.37***	-0.30***
Self-Employed					-0.57***	-0.59***	-0.59***	-0.65***
(Full Time)								
Mothers' Work History								
Stayhome						-0.16***	-0.17***	-0.17***
Some Work						-0.20*	-0.15+	-0.09
Missing						-0.39***	-0.37***	-0.35***
(Working)								
Coresidence								
Live with One Parent							-0.51***	-0.37***
Independent							-0.13***	-0.17***
Independent with One Deceased Parent							-0.43***	-0.52***
Both Parents Deceased							-0.82***	-1.03***
Missing							0.20**	0.08
(Living with Both Parents)								
Birth Cohort								
Birth Cohort after 1959								-0.61***
(Birth Cohrt before 1958)								
Interaction								
Family Heir*Birth Cohort after 1959								
Constant	0.63***	-3.60***	-3.62***	-3.67***	-3.67***	-3.57***	-3.51***	-3.17***

N	103,347	103,347	103,347	103,347	103,347	103,347	103,347	103,347
Log Likelihood Ratio	-67501.38	-22158.4	-22089.24	-22008.88	-21956.26	-21925.85	-21833.75	-21590.49
Chi	28.23	5521.65	5695.75	6423.25	6511.96	6570.14	6661.12	6963.48

Only Child, Eldest vs. Others

Only Child	-0.22***	-0.29***	-0.26***	-0.26***	-0.27***	-0.26***	-0.23***	-0.18**
Eldest daughters	-0.12***	-0.16***	-0.12**	-0.11**	-0.11**	-0.10**	-0.11**	-0.05
(Others)								
Interaction								
Only Child*Birth Cohort after 1959								
Eldest*Birth Cohort after 1959								
Constant	-2.63***	-3.60***	-3.62***	-3.67***	-3.67***	-3.57***	-3.51***	-3.17***
N	103,347	103,347	103,347	103,347	103,347	103,347	103,347	103,347
Log Likelihood Ratio	-24969.75	-22156.42	-22086.82	-22006.28	-21953.48	-21923.09	-21832.13	-21588.51
Chi	40.06	5521.32	5694.95	6420.81	6509.39	6569.38	6660.23	6787.39

reference in ( )
legend +<0.10, * p<.05; ** p<.01; *** p<.001

Table 4a

Never Married vs. Arranged Marriage by Family Heirs vs. Non-Family Heirs

	Model1	Model2	Model3	Model4	Model5
Heir Status					
Family Heir	-0.19***	-0.15*	-0.16**	-0.03	0.02
(Others)					
Age					
Age 23-28		3.87***	3.85***	3.76***	3.76***
Age 29-33		5.47***	5.46***	5.28***	5.28***
Age 33+		4.73***	4.76***	4.32***	4.32***
(Age 18-22)					
Education					
Junior High			-0.34**	-0.50***	-0.50***
Senior High Plus			-0.40***	-0.19+	-0.19
University Plus			0.07	0.11+	0.11+
(Senior High)					
Birth Cohort					
Birth Cohort after 1959				-1.36***	-1.20***
(Birth Cohrt before 1958)					
Interaction					
Family Heir*Birth Cohort after 1959					-0.25

Constant	-4.32***	-8.28***	-8.23***	-7.71***	-7.74***
N	102,077	102,077	102,077	102,077	102,077
Log Likelihood Ratio	-25220.55	-22714.81	-22698.09	-22507.13	-22505.35
Chi	50.52	3028.09	3099.76	3458.27	3481.9
Only Child, Eldest vs. Others					
Only Child	-0.41**	-0.40**	-0.42**	-0.18	-0.11
Eldest Sons	-0.16**	-0.13*	-0.14*	-0.01	0.03
(Others)					
Interaction					
Only Child*Birth Cohort after 1959					-0.31
Eldest*Birth Cohort after 1959					-0.23
Constant	-4.32***	-8.28***	-8.23***	-7.71***	-7.74***
N	102,077	102,077	102,077	102,077	102,077
Log Likelihood Ratio	-25218.74	-22712.33	-22695.41	-22506.04	-22501.58
Chi	54.53	3030.61	3102.16	3459.74	3494.07

reference in ( )
legend +<0.10, * p<.05; ** p<.01; *** p<.001

Table 4b
Never Married vs. Love Marriage by Family Heirs vs. Non-Family Heirs

	Model1	Model2	Model3	Model4	Model5
Heir Status					
Family Heir	-0.15***	-0.15***	-0.15***	-0.13***	-0.10*
1(Others)					
Age					
Age 23-28		1.97***	1.99***	1.98***	1.98***
Age 29-33		2.18***	2.20***	2.18***	2.18***
Age 33+		1.14***	1.16***	1.10***	1.10***
(Age 18-22)					
Education					
Junior High			-0.08	-0.1+	-0.1+
Senior High Plus			-0.11*	-0.08	-0.08
University Plus			-0.04	-0.03	-0.03
(Senior High)					
Birth Cohort					
Birth Cohort after 1959				-0.15***	-0.11*
(Birth Cohrt before 1958)					
Interaction					
Family Heir*Birth Cohort after 1959					-0.07

Constant	-2.93***	-4.31***	-4.30***	-4.22***	-4.24***
N	102,077	102,077	102,077	102,077	102,077
Log Likelihood Ratio	-25220.55	-22714.81	-22698.09	-22507.13	-22505.35
Chi	50.52	3028.09	3099.76	3458.27	3481.9

Only Child, Eldest vs. Others

Only Child	-0.19**	-0.21***	-0.21**	-0.18**	0.02
Eldest Sons	-0.14***	-0.15***	-0.14***	-0.13***	-0.11*
(Others)					
Interaction					
Only Child*Birth Cohort after 1959					-0.35**
Eldest*Birth Cohort after 1959					-0.04
Constant	-2.93***	-4.31***	-4.30***	-4.22***	-4.24***
N	102,077	102,077	102,077	102,077	102,077
Log Likelihood Ratio	-25218.74	-22712.33	-22695.41	-22506.04	-22501.58
Chi	54.53	3030.61	3102.16	3459.74	3494.07

reference in ( )
legend +<0.10, * p<.05; ** p<.01; *** p<.001

Table 4c
Love Marriage vs Arranged Marriage by Family Heirs vs. Non-Family Heirs

	Model1	Model2	Model3	Model4	Model5
Heir Status					
Family Heir	0.04	0	0.01	-0.1	-0.12
(Others)					
Age					
Age 23-28		-1.90***	-1.87***	-1.78***	-1.78***
Age 29-33		-3.28***	-3.26***	-3.11***	-3.11***
Age 33+		-3.59***	-3.60***	-3.21***	-3.21***
(Age 18-22)					
Education					
Junior High			0.26*	0.40**	0.40**
Senior High Plus			0.30*	0.11	0.11
University Plus			-0.11	-0.14+	-0.14+
(Senior High)					
Birth Cohort					
Birth Cohort after 1959				1.21***	1.09***
(Birth Cohrt before 1958)					
Interaction					
Family Heir*Birth Cohort after 1959					0.17
Constant	1.39***	3.97***	3.93***	3.49***	3.50***

N	102,077	102,077	102,077	102,077	102,077
Log Likelihood Ratio	-25220.55	-22714.81	-22698.09	-22507.13	-22505.35
Chi	50.52	3028.09	3099.76	3458.27	3481.9

Only Child, Eldest vs. Others

Only Child	0.22	0.18	0.21	0	0.12
Eldest Sons	0.02	-0.02	-0.01	-0.11	-0.14
(Others)					
Interaction					
Only Child*Birth Cohort after 1959					0.19
Eldest*Birth Cohort after 1959					
Constant	1.39***	3.97***	3.93***	3.49***	3.50***
N	102,077	102,077	102,077	102,077	102,077
Log Likelihood Ratio	-25218.74	-22712.33	-22695.41	-22506.04	-22501.58
Chi	54.53	3030.61	3102.16	3459.74	3494.07

reference in ( )
legend +<0.10, * p<.05; ** p<.01; *** p<.001

Table 5a

Never Married vs. Arranged Marriage by Family Heirs vs. Non-Family Heirs

First Marriage	Model1	Model2	Model3	Model4	Model5	Model6	Model7	Model8
Heir Status								
Family Heir	-0.20**	-0.26***	-0.22**	-0.21**	-0.21**	-0.20**	-0.21**	-0.08
(Others)								
Age								
Age 23-28		2.54***	2.60***	2.57***	2.58***	2.59***	2.59***	2.57***
Age 29-33		2.57***	2.62***	2.59***	2.60***	2.62***	2.69***	2.62***
Age 33+		1.48***	1.48***	1.44***	1.45***	1.49***	1.63***	1.17***
(Age 18-22)								
Education								
Junior High			0.63***	0.49***	0.49***	0.53***	0.63***	0.36**
Senior High Plus			-0.07	-0.1+	-0.1+	-0.08	-0.1+	0.07
University Plus			-0.24**	-0.28**	-0.27**	-0.24**	-0.26**	-0.11
(Senior High)								
Type of Occupation								
Farmers/business/factoryworkers				0.55***	0.56***	0.53***	0.56***	0.51***
Professional /Manager				0.21**	0.21**	0.19*	0.26***	0.23**
Service				-0.08	-0.05	-0.08	-0.04	-0.01
Not Working				0.13	0.12	0.13	0.16	0.25*
(Administration)								
Occupational Status								
Not Full Time					-0.24*	-0.24*	-0.25*	-0.11
Self-Employed					0	-0.05	-0.06	-0.2
(Full Time)								
Mothers' Work History								
Stayhome						-0.38***	-0.41***	-0.43***
Some Work						-0.42*	-0.39*	-0.27
Missing						-0.75***	-0.73***	-0.67***

(Working)								
Coresidence								
Live with One Parent							-1.49***	-1.15***
Independent							-0.52***	-0.61***
Independent with One Deceased Parent							-0.57***	-0.79***
Both Parents Deceased							-0.93**	-1.36***
Missing							-0.14	-0.40**
(Living with Both Parents)								
Birth Cohort								
Birth Cohort after 1959								-1.46***
(Birth Cohrt before 1958)								
Interaction								
Family Heir*Birth Cohort after 1959								
Constant	-4.10***	-5.51***	-5.54***	-5.58***	-5.57***	-5.37***	-5.21***	-4.54***
N	103,347	103,347	103,347	103,347	103,347	103,347	103,347	103,347
Log Likelihood Ratio	-28606.64	-25728.4	-25656.65	-25541.98	-25475.85	-25431.79	-25311.04	-24922.66
Chi	38.88	5472.95	5655.87	6460.74	6593.66	6705.39	6853.48	7582.71
Only Child, Eldest vs. Others								
Only Child	-0.21*	-0.31**	-0.28*	-0.28*	-0.29*	-0.27*	-0.26*	-0.13
Eldest Daughters	-0.20**	-0.24**	-0.18*	-0.17*	-0.18*	-0.16*	-0.18*	-0.05
(Others)								
Interaction								
Only Child*Birth Cohort after 1959								
Eldest*Birth Cohort after 1959								
Constant	-4.10***	-5.51***	-5.54***	-5.58***	-5.57***	-5.37***	-5.21***	-4.54***
N	103,347	103,347	103,347	103,347	103,347	103,347	103,347	103,347
Log Likelihood Ratio	-28605.35	-25726.29	-25654.14	-25539.29	-25473.01	-25429	-25309.4	-24920.82

Chi	41.23	5472.64	5655.47	6458.62	6591.29	6704.68	6852.93	7581.99

reference in ( )
legend +<0.10, * p<.05; ** p<.01; ***
p<.001

Table 5b

Never Married vs. Love Marriage by Family Heirs vs. Non-Family Heirs

First Marriage	Model1	Model2	Model3	Model4	Model5	Model6	Model7	Model8
Heir Status								
Family Heir	-0.14***	-0.19***	-0.15***	-0.14***	-0.14***	-0.14***	-0.13***	-0.10**
(Others)								
Age								
Age 23-28		1.93***	2.00***	1.90***	1.91***	1.91***	1.93***	1.93***
Age 29-33		1.52***	1.58***	1.47***	1.51***	1.52***	1.57***	1.55***
Age 33+		0.48***	0.50***	0.39***	0.44***	0.46***	0.56***	0.41***
(Age 18-22)								
Education								
Junior High			0.40***	0.22**	0.23**	0.25**	0.28***	0.18*
Senior High Plus			-0.07*	-0.07	-0.06	-0.06	-0.07	-0.03
University Plus			-0.34***	-0.32***	-0.29***	-0.28***	-0.31***	-0.26***
(Senior High)								
Type of Occupation								
Farmers/business/factoryworkers				0.43***	0.54***	0.53***	0.52***	0.51***
Professional /Manager				0.24***	0.26***	0.26***	0.27***	0.26***
Service				0.44***	0.56***	0.55***	0.55***	0.56***
Not Working				-0.27***	-0.30***	-0.29***	-0.32***	-0.28***
(Administration)								
Occupational Status								
Not Full Time					-0.41***	-0.41***	-0.41***	-0.36***
Self-Employed					-0.81***	-0.83***	-0.82***	-0.85***

(Full Time)						-0.10***	-0.10***	-0.10**
Mothers' Work History								
Stayhome						-0.10**	-0.10**	-0.10**
Some Work						-0.14	-0.09	-0.05
Missing						-0.29***	-0.28***	-0.26**
(Working)								
Coresidence								
Live with One Parent							-0.32**	-0.24*
Independent							-0.03	-0.05
Independent with One Deceased Parent							-0.38***	-0.44***
Both Parents Deceased							-0.79***	-0.93***
Missing							0.29***	0.22**
(Living with Both Parents)								
Birth Cohort								
Birth Cohort after 1959								-0.38***
(Birth Cohrt before 1958)								
Interaction								
Family Heir*Birth Cohort after 1959								
Constant	-2.89***	-3.76***	-3.77***	-3.83***	-3.83***	-3.77***	-3.74***	-3.52***
N	103,347	103,347	103,347	103,347	103,347	103,347	103,347	103,347
Log Likelihood Ratio	-28606.64	-25728.4	-25656.65	-25541.98	-25475.85	-25431.79	-25311.04	-24922.66
Chi	38.88	5472.95	5655.87	6460.74	6593.66	6705.39	6853.48	7582.71

Only Child, Eldest vs. Others

Only Child	-0.22***	-0.29***	-0.26***	-0.25***	-0.26***	-0.25***	-0.22***	-0.19**
Eldest Daughters	-0.10**	-0.14***	-0.10*	-0.09*	-0.09*	-0.08*	-0.09*	-0.06
(Others)								
Interaction								
Only Child*Birth Cohort after 1959								

Eldest*Birth Cohort after 1959								
Constant								
N	103,347	103,347	103,347	103,347	103,347	103,347	103,347	103,347
Log Likelihood Ratio	-28605.35	-25726.29	-25654.14	-25539.29	-25473.01	-25429	-25309.4	-24920.82
Chi	41.23	5472.64	5655.47	6458.62	6591.29	6704.68	6852.93	7581.99

reference in ( )
legend +<0.10, * p<.05; ** p<.01; *** p<.001

Table 5c

Love Marriage vs Arranged Marriage by Family Heirs vs. Non-Family Heirs

First Marriage	Model1	Model2	Model3	Model4	Model5	Model6	Model7	Model8
Heir Status								
Family Heir	0.06	0.07	0.06	0.07	0.07	0.06	0.07	-0.02
(Others)								
Age								
Age 23-28		-0.61***	-0.60***	-0.68***	-0.67***	-0.67***	-0.66***	-0.65***
Age 29-33		-1.06***	-1.04***	-1.12***	-1.09***	-1.10***	-1.12***	-1.07***
Age 33+		-1.01***	-0.98***	-1.05***	-1.01***	-1.04***	-1.07***	-0.76***
(Age 18-22)								
Education								
Junior High			-0.23*	-0.27*	-0.26*	-0.29*	-0.36**	-0.18
Senior High Plus			0	0.03	0.03	0.02	0.03	-0.09
University Plus			-0.1	-0.04	-0.02	-0.04	-0.04	-0.15
(Senior High)								
Type of Occupation								
Farmers/business/factoryworkers				-0.12	-0.02	0	-0.03	0

Professional /Manager				0.03	0.06	0.07	0.01	0.03
Service				0.52***	0.60***	0.63***	0.59***	0.57***
Not Working				-0.40***	-0.41***	-0.42***	-0.48***	-0.53***
(Administration)								
Occupational Status								
Not Full Time					-0.17	-0.17	-0.16	-0.26*
Self-Employed					-0.81***	-0.77***	-0.76***	-0.66***
(Full Time)								
Mothers' Work History								
Stayhome						0.28***	0.31***	0.33***
Some Work						0.27	0.31	0.22
Missing						0.47**	0.45**	0.41*
(Working)								
Coresidence								
Live with One Parent							1.17***	0.91**
Independent							0.50***	0.55***
Independent with One Deceased Parent							0.18	0.34***
Both Parents Deceased							0.14	0.43
Missing							0.44**	0.62***
(Living with Both Parents)								
Birth Cohort								
Birth Cohort after 1959								1.08***
(Birth Cohrt before 1958)								
Interaction								
Family Heir*Birth Cohort after 1959								
Constant	1.21***	1.75***	1.77***	1.75***	1.74***	1.60***	1.47***	1.02***
N	103,347	103,347	103,347	103,347	103,347	103,347	103,347	
Log Likelihood Ratio	-28606.64	-25728.4	-25656.65	-25541.98	-25475.85	-25431.79	-25311.04	-24922.66
Chi	38.88	5472.76	5655.87	6460.74	6593.66	6705.39	6853.48	7582.71

Only Child, Eldest vs. Others

Only Child	-0.01	0.02	0.02	0.03	0.03	0.02	0.04	-0.06
Eldest Daughters	0.09	0.1	0.08	0.08	0.09	0.08	0.08	0
(Others)								
Interaction								
Only Child*Birth Cohort after 1959								
Eldest*Birth Cohort after 1959								
Constant	1.21***	1.75***	1.77***	1.75***	1.74***	1.60***	1.47***	1.02***
N	103,347	103,347	103,347	103,347	103,347	103,347	103,347	103,347
Log Likelihood Ratio	-28605.35	-25726.29	-25654.14	-25539.29	-25473.01	-25429	-25309.4	-24920.82
Chi	41.23	5472.64	5655.47	6458.62	6591.29	6704.68	6852.93	7581.99

reference in ( )
legend +<0.10, * p<.05; ** p<.01; ***
p<.001

REFERENCES

Allison, Paul D. 1982a. "Discrete-Time Methods for the Analysis of Event Histories." *Sociological Methodology* 13:61-98.

------.1982b. "Discrete-Time Methods for the Analysis of Event Histories." *Sociological Methodology* 13:61-98.

Hiroshima, Kiyoshi. 1983. "Effects of Sibling Number on Demographic Behavior in Japan." *The Journal of Population Studies* 6:23-30.

Hodge, Robert W. and Naohiro Ogawa. 1986. *Siblings and Family Size from Generation to Generation* Tokyo, Japan: Nihon University Population Research Institute.

Kojima, Hiroshi. 1994. "Determinants of First Marital Formation in Japan: Does the Sibling Configuration Matter?" *Japan Review* 5:187-209.

Martin, Linda G. and Noriko O. Tsuya. 1991. "Interactions of Middle-Aged Japanese with their Parents." *Population Studies* 45: 299-311.

Kokuritsu Shakaihoshou Jinkoumondai Kenkyusho, editor. 1997. *Heisei 9-Nen Dokushin Seinensouno Kekkonkanto Kodomokan: Dai 11-Kai Shussei Doukou Kihonchousa.* Kousei Toukei Kyoukai published in Heisei.

National Institute of Population and Social Security Research (NIPSSR). 1998. "The Eleventh Japanese National Fertility Survey in 1997 Volume I; Marriage and Fertility in Present-Day Japan." 13.

Raymo, James M. 2003a. "Premarital Living Arrangements and the Transition to First Marriage in Japan." *Journal of Marriage and Family* 65:302-15.

Raymo, James M. 2003b. "Educational Attainment and the Transition to First Marriage among Japanese Women." *Demography, 2003, 40, 1, Feb* 40:83-103.

Raymo, James M. and Miho Iwasawa. 2005. "Marriage Market Mismatches in Japan: An Alternative View of the Relationship between Women's Education and Marriage." *American Sociological Review* 70:801-22.

Yamaguchi, Kazuo. 1991. *Event History Analysis.* Newbury Park, Calif.: Sage Publications.

Sakai, Hiromichi. 1992. "Kyoudaikouseiga Kekkonnnenreini Oyobosu Eikyou [Effects of the Sibling Configuration on the Timing of Marriage]." *Journal of Population Studies* 15: 57-61.

Ohtani, Kenji. 1989. "Shokonkakuritsuto Daiichishuseikakuritsuno Proportional Hazard Model Bunseki [Probability of Marriage and First Birth by Proportional Hazard Model]." *Journal of Population Problems* 45: 46-50