Shifting Economic Foundation of Marriage in Japan
The Erosion of Traditional Marriage

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Abstract

Japan is one of few developed countries in which marriage and higher earning potential among women are negatively associated. As the proportion of births occurring outside of marriage remains low in Japan, fertility is still significantly influenced by marriage trends, which are in turn influenced by societal expectations regarding the marriageability of educated women. Previous studies have suggested that the economic independence associated with higher education is at the root of this negative relationship, but how persistent will this relationship prove to be? As women's education rapidly catches up with men's, there is reason to suspect that marriage trends are also in transition. This study examines the latest marriage-related behavior patterns among Japanese women from 2002 onward, focusing on the relationship between women's economic emancipation and marriage in a gender-traditional society. Using a newly available large panel survey on young adults in Japan, it will demonstrate that the effects of women's education have reversed, and are now in fact positive.

1. Introduction

Both sociological and economic theories of marriage emphasize the concept of specialization and exchange between spouses (e.g., Becker 1981; Parsons 1949). In his economic theory of marriage, Becker (1981) claims that the benefits of marriage are maximized when man and woman are each specialized in either market labor or household activities, and pool their individual gains. In modern society, in which men typically have better positions than women do in the labor market and women are thought to enjoy advantages relative to men in domestic labor, benefits from marriage are maximized when the husband is specialized in market production, and the wife in household tasks (Becker 1981). Thus, the growth of women's economic independence, seen in increased levels of participation by women in higher education and the labor force, reduces the desirability of marriage by minimizing the respective gains of each partner. Becker (1981) argues that women's economic independence is a major cause of later and less frequent marriage in today's developed countries. The hypothesis based on this proposition is called the *economic independence hypothesis*.

While the economic independence hypothesis remains popular, recent studies on marriage in Western countries show less support for the specialization and trading model of marriage. Longitudinal analyses of individual-level data investigate the relationship between women's earnings potential—as indicated by educational attainment, employment, and earnings—and marriage intensities or hazard rates. Yet, these studies found either no relationship or no negative relationship between the two variables (see review for Oppenheimer 1994, 1997). Furthermore, the economic independence hypothesis was criticized for its inability to explain the timing of marriage (Oppenheimer 1988, 1994, 1997). The hypothesis explains, to a certain extent, the mechanism of the choice to forgo marriage, but it fails to account for marriage postponement, which is a major component in the decline of annual marriage rates (e.g., Goldstein and Kenney 2001). As a result, its application often raises issues concerning the measurement of marriage, e.g., whether to measure marriage postponement or non-marriage in empirical testing. In addition, attempts to test this hypothesis often lead to inconclusive results (Oppenheimer, Blossfeld and Wackerow 1995).

As an alternative, Oppenheimer (1988) has suggested using a spouse-search model to explain marriage timing. Oppenheimer (1988, 1994, 1997) applied job-search theory to the mate-selection process. In the spouse-search model, a woman's greater economic resources increase her incentives and capacity to prolong her spouse-search processes in order to find a more precise match. The spouse-search model assumes, however, that a woman's high earnings potential relates positively rather than negatively to her attractiveness as a marriage partner. It is easily understood in a society in which the dual-earner family-type is widely accepted that a woman with higher earnings is in a favorable marriage-market position. However, even in gender-traditional societies, in which a family's economy is heavily dependent on a husband's earnings, a wife's earnings can contribute to early marriage by supplementing the often-low earnings of young men (Oppenheimer 1988). Therefore, a woman's high earning potential can have a positive effect on marriage formation by offsetting the presumed negative effects of a woman's greater economic independence (Oppenheimer et. al. 1995). In this article, this hypothesis is called the *spouse-search*

hypothesis.

As women's economic resources become more positively associated with marriage, the spouse-search hypothesis is gaining support in recent studies of marriage in Western countries (Blossfeld and Huinink 1991; Santow and Bracher 1994; Bracher and Santow 1998; Oppenheimer and Lew 1995; Thornton, Axinn and Teachman 1995; Goldstein Kenney 2001; Sweeney 2002). However, the comparative studies suggest that the relationship between women's economic positions and marriage intensities differ according to the gender context in a given society (Blossfeld 1995; Ono 2003). These studies have found that indicators of women's higher earning potential, such as educational attainment, have insignificant, or even positive effects in countries with higher levels of gender equality, but are believed to have strong negative effects on marriage in countries with strong gender divisions. According to these studies (Blossfeld 1995; Ono 2003), the countries with higher gender equality include Sweden, the former West Germany, France, the Netherlands, Hungary, and the USA; countries characterized by pronounced gender divisions include Japan and Italy. In sum, traditional gender divisions within the family are fundamental to the theoretical basis of Becker's theory. In this respect, marriage behaviors in contemporary Japan have been evidence that the economic theory of marriage is still valid (e.g. Raymo 1998, 2003; Raymo and Iwasawa 2005) when family roles of spouses are highly gender asymmetric (Tsuya and Mason 1995; Fuwa 2004; Tsuya et al. 2005).

It is important to note that the characteristics considered important in a spouse also change over time. For example, in the United States, a college degree once decreased a woman's marriageability, while after the 1955-1959 cohort, her likelihood of having married at the age of 50 is greater than that of non-college-educated women (Goldstein and Kenney 2001). Sweeney and Cancian (2004) also showed that in the United States, the positive associations between wives' premarital wages and husbands' expected earnings or occupational status became stronger in younger cohorts. They concluded that "women's economic prospects have become more important in determining their position in the marriage market" (Sweeney and Cancian 2004: 1026).

Women's economic qualifications became more important in the United States as more women continued to work after marriage and increase their contribution to the household economy. Goldin (2006) illustrated historical development of women's increased involvement in the economy in the United States, arguing that, since the late 1970s, women's economic emancipation in the United States is in a "revolutionary phase". In this revolutionary phase, women are more likely to anticipate their future work lives during the early educational period. Secondly, women find their identity in their profession or career. Therefore, they are more actively involved with their career rather than being contended with the status of the secondary provider. Similar developments are also confirmed by cross-national studies of female labor force participation (e.g. Drobnic and Blossfeld 2001). Blossfeld and Drobnic (2001) characterized the general trends of women's increased economic emancipation as a shift from the male-bread winner family to the dual-earner family. Yet, they also found that the changes in gender role have been asymmetric, "with a greater movement of women into the traditional male sphere than vice versa" (Drobnic and Blossfeld

2001: 372).

In sum, the empirical test of the two competing hypotheses has significance in explaining the economic foundation of marriage in contemporary Japan. The two competing hypotheses can represent different phases of social change. When the economic independence hypothesis is supported, the economic foundations of marriage in a society are based on male-breadwinners, with insignificant economic contribution from wives. On the other hand, the spouse-search hypothesis is more likely to be supported when the dual-earner family is widely accepted in a society. The spouse-search hypothesis assumes that women's economic resources can be positively related to marriage even in a gender-divided society (Oppenheimer 1988). However, as shown in the empirical analyses of the cross-national studies, negative effects of women's economic resources are superior to those of positive effects on marriage formation in gender-traditional societies (Blossfeld 1995, Ono 2003). By testing these two hypotheses on the latest marriage behavior, this study is able to examine the social changes taking place in Japan.

The future trends in marriage are significantly affected by whether higher education among women positively or negatively correlates to marriageability, and whether highly educated women will avoid marrying as access to higher education becomes universal in Japan.

Using the largest and latest panel survey on young adults in Japan, this article attempts to explain current and future trends in Japanese marriage through empirical testing of the two hypotheses on the recent marriage behaviors of Japanese women in 2002-2006. In the next section, the relationship between women's educational levels and marriage formation in Japan is discussed in detail.

2. Women's Education and Marriage Behaviors in Japan

Women's enrollment in tertiary education has risen steadily through the post-war period in Japan (Figure 1). The proportion of young adults enrolled in two-year junior colleges and four-year universities had increased dramatically by the middle of the 1970s. The trend stagnated during the 1980s and started to pick up again in the 1990s, women's educational gains being more stable than men's throughout the period. Women's enrollment in tertiary education reached its highest point in the middle of the 1990s. Since then, it has remained at the same level, but women are becoming increasingly likely to go to university rather than junior college. As university graduates generally possess greater labor market skills (Ishida 1998), the increase in university-educated women implies that the potential earning power of Japanese women has grown substantially.

Figure 1. Progression Ratio to Post-Secondary Education, by Sex and Type of Institution: 1955-2005.
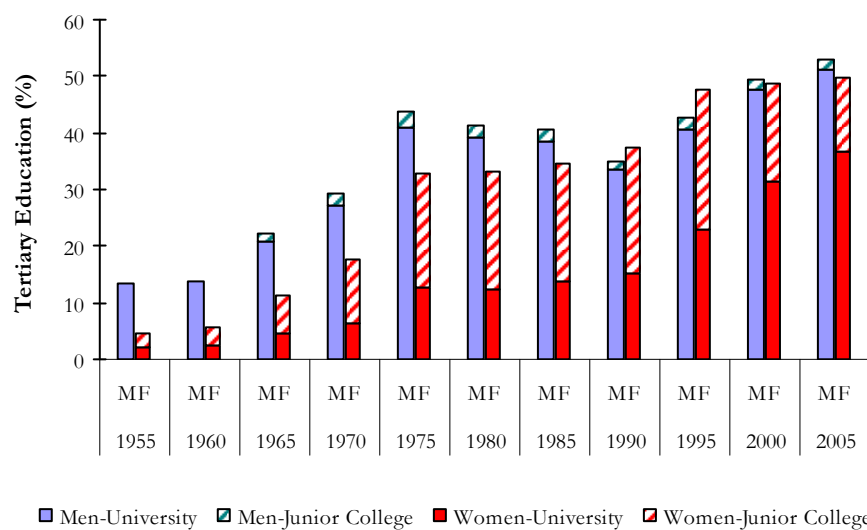
Sources: School Basic Survey, various years, Japanese Ministry of Education, Culture, Sports, Science, and Technology.

Trends in Japan show not only substantial marriage delays, but also an increase in the number of young women who do not marry. The mean age at first marriage among Japanese women has increased rapidly over the past four decades, from 24.2 in 1970 to 28.3 in 2007 (NIPSSR 2009). Consistent with this delay, the proportion of unmarried women in the 25-29 and 30-34 age groups increased sharply between 1970 and 2005: from 18.1% to 59.0%, and from 7.2% to 32.0%, respectively. In the birth cohort of 1955, just 5.8% of Japanese women were unmarried through age 50. However, according to Japan's official population projections conducted in 2005, the proportion of Japanese women in the 1975 cohort who will be unmarried at age 50 could reach 20.0%, if the marriage patterns of this cohort follow those of preceding cohorts after the age of 30 (NIPSSR 2006).

Why have marriage rates fallen so rapidly in Japan? One explanation for the steep decline is provided by the traditional economic theory of marriage (Becker 1981). Japan has been one of only a few developed countries in which women's earnings potential, as indicated by post-secondary education and high income levels, used to be negatively associated with marriage hazards or lifetime rates. While marriage risks among Japanese women who are university graduates show some signs of catching up when these women reach their mid-twenties (Tsuya and Mason 1995), their lifetime probabilities of never being married are estimated as being the highest among all educational levels (Ogawa 1997; Retherford, et al. 2001; Raymo 2003b; Raymo and Iwasawa 2005; Tsuya 2006, 2009). Panel studies of marriage further show that women with higher incomes are less likely to marry. (Higuchi 2001; Ono 2003). These results were interpreted as a confirmation of the economic independence hypothesis; i.e., women with high earnings potential do not fit in the traditional form of marriage, in which the husband specializes in labor market activities while the wife maintains the home and rears the children (Tsuya and Mason 1995; Raymo and Iwasawa 2005; Ono 2003; Raymo 2003b).

An alternative explanation regarding the negative correlation of women's high educational levels and marriage intensities in Japan is, however, suggested by Raymo and Iwasawa (2005). In their study of educational assortative mating in Japan between 1980 and 1995, Raymo and Iwasawa (2005) provided evidence that women's economic independence, as well as female status hypergamy, plays a major role in explaining the low marriage propensities of university-educated women. Their results indicated that one-fourth to one-third of the decline in marriage rates among women with post-secondary education is explained by the compositional changes in education levels in the marriage market. That is, given the more rapid expansion of women's participation in post-secondary education compared with that of men, the desire among women to marry men with the same or higher levels of education has caused a marriage squeeze for highly educated women, as the relative supply of better or similarly qualified men has decreased. In fact, highly educated women has a higher tendency to marry homogamously in Japan (Suzuki 1991; NIPSSR 2007a), although the tendency appears to have weakened slightly in recent years (Xie and Raymo 2000; Miwa 2005; NIPSSR 2007a). Furthermore, changes in the educational composition of the marriage market have been so rapid that, while in 1970 there were about two men in the same education and age groups for each woman aged 25-29 with a post-secondary education, in 2000 there were just 0.9 men for each woman in the same education and age group (Raymo and Iwasawa 2005). This provides a plausible explanation for the greater decline in marriage rates among highly educated Japanese women than among their less educated counterpart. This result led the study's authors to conclude that, "to a large extent, apparent support for the economic independence hypothesis in Japan (Ono 2003; Raymo 2003b) actually reflects differential changes in the availability of potential mates" (Raymo and Iwasawa 2005: 817). Raymo and Iwasawa (2005) call this explanation the *marriage market mismatch hypothesis.*

On the other hand, empirical evidence of the spouse-search hypothesis is relatively scarce and rather mixed in Japan. Raymo and Iwasawa (2005) found no evidence of an increase in marriage rates at older ages among highly educated women in the period of 1980-1995, and concluded that the spouse-search theory did not apply to Japanese marriage. Other studies show that women who are unemployed, in part-time jobs, or employed on fixed-term contracts have lower rates of marriage than those in regular full-time employment (not controlling for women's own income) (Nagase 2002, Sakai and Higuchi 2005). Seeking to explain these findings, the authors of both studies speculated that the workplace may function as a marriage market for women who work full-time. However, these results also seem to be consistent with the spouse-search hypothesis, which assumes that a higher income has a positive effect on women's chances of marrying. Kato's (2004) study is the only study that explicitly examined the spouse-search hypothesis in first marriages among men and women born in 1931-1970. He found indirect support for the spouse-search hypothesis by showing strongly positive gradients in the effects of men's first occupations on marriage hazards: e.g., a man who works for a large company has the highest hazard of marriage of all occupational groups. Furthermore, his analysis showed that occupational gradients in marriage hazards decrease in times of high GDP growth rates, when men's economic prospects are more certain, while they increase at times of low economic growth, when there is a large degree of uncertainty in men's careers.

However, when he looked at women, he found neither strong occupational gradients in marriage hazards, nor any interaction effects with economic growth. Hence, Kato (2004) concluded that, in Japan, where the family economy is heavily based on the male-breadwinner model, women's marriage timing is much more affected by men's marriage timing, as the spouse-search hypothesis suggests (e.g., Oppenheimer 1988).

In Japan, unlike Western countries, the economic status of women has had a consistently negative impact on marriage formation. These results may be attributed to the relatively high degree of gender division in family life (Tsuya and Mason 1995; Fuwa 2004; Tsuya et al. 2005). Previous studies have almost entirely interpreted this as a negative consequence of women's economic independence on marriage, and as a corroboration of the economic independence hypothesis (Ogawa 1997; Higuchi 2001; Retherford et al. 2001; Ono 2003; Raymo 2003b). The only exception is a study by Raymo and Iwasawa (2005), in which the authors posited that the marriage squeeze among highly educated women may be due to the relative decline in the supply of highly educated men. Although the demographic impact of educational upgrading among women is certainly an important factor in explaining the relationship between educational levels and marriage trends, the marriage market mismatch hypothesis is difficult to test when the observation period is relatively short, as educational compositions in the marriage market do not change much over a short period. Consequently, this study is not going to test the marriage market mismatch hypothesis. Rather, it focuses on marriage behaviors in a period in which women's educational upgrading has already reached its highest point and remains relatively unchanged. Finally, while Oppenheimer's spouse-search hypothesis provides a very appealing explanation for the current trend of marriage postponement in Japan, only a few studies have explicitly examined this hypothesis, and with mixed results (Kato 2004; Raymo and Iwasawa 2005).

No previous analysis of Japanese marriage has either addressed the theoretical importance of differentiating the two hypotheses, or investigated the two competing hypotheses in a systematic way. In fact, the testing of both the economic independence hypothesis and the spouse-search hypothesis has been largely hindered by the limited data availability in Japan. Previous studies relied on either retrospective data (Tsuya and Mason 1995; Ogawa 1997; Retherford, et al. 2001; Raymo 2003b; Raymo and Iwasawa 2005; Tsuya 2006, 2009) which does not contain information of women's income during the risk of marriage, or a panel survey with relatively small non-probabilistic samples (Higuchi 2001; Ono 2003; Fukuda 2007). As a result, the reliable estimates have not been given in the effects of women's income, a direct measure of women's current degree of economic independence on marriage intensities (Oppenheimer et al, 1995). Alternatively, education or first occupation was typically used as a proxy for women's earnings potential (Tsuya and Mason 1995, Ogawa 1997; Retherford et al. 2001, Raymo 2003b, Kato 2004, Tsuya 2006, 2009). It is argued, however, that education can reflect individual preferences in life style, gender values and career aspirations (Sørensen 1995). The same is applicable to the first job. For this reason, it remains uncertain that how much of the effects of these variables are truly interpreted as women's earnings potentials. Although a simple measure of income may not be superior to other variables as a measure of women's earnings potential (Xie et al. 2003), adding income variables to the model will give a clearer

insight into the relationship between women's economic standings and marriage risks. It will also strengthen the validity of the empirical testing of the two competing hypotheses mentioned above. Using a recent, large-scale panel survey with a rich set of economic variables, this study provides initial results of empirical testing for the relative importance of the economic independence hypothesis and the spouse-search hypothesis in recent marriages in Japan.

3. Data and Method

3-1. Data

The data used for the analyses comes from the first through fifth waves of the Longitudinal Survey of Young Adults in the 21st Century (LSYA21), conducted by the Japanese Ministry of Health, Labor, and Welfare. The LSYA21 is an ongoing annual panel survey that began in November 2002. The samples initially consisted of men and women aged 20-34 and their spouses, who were randomly drawn from nationwide sampling blocks in October 2002. A total of 35,448 men and women are included in the first wave sampling, and 29,052 of them validly responded to the survey. The valid response rate of 82.0% is exceptionally high compared with other panel surveys in Japan. The survey was designed to capture the changes in marital status, family compositions, employment, values and attitudes concerning work and family among Japanese young adults in the 21st century. The LSYA21 represents one of the most reliable and suitable forms of data for examining our research questions available in Japan.

3-2. Method

The subject of analysis is single women aged 20-34 in the first wave of the survey. Since the LSYA21 does not have information on the respondents' marital status prior to the survey, it is assumed that single women with no children at the time of the first survey had never been married[1]. Their marital status is followed until the fifth wave of the survey. In other words, the marriage risks of presumably never married women in the period between November, 2002 and November, 2006, who were born between 1968 and 1982, are analyzed in this study

Due to the nature of the survey, these samples are left-truncated when the risk of event occurrences has started before the period of observation (Guo 1993). Women's legal age for marriage is 16 in Japan. Therefore, essentially all the samples are left-truncated in this data. It is often the case that remaining samples are selected from a group with a low risk of event occurrences. Guo (1993), however, showed that when the risk sample is randomly taken and the starting time of the event risk is known, a conditional likelihood approach could give unbiased estimates of parameters in event-history analysis. In our data, the risk sample is taken randomly. It has to be assumed that the risk of marriage starts at age 20, since the earliest marriage found in our data was at age 20. Then, we can apply the conditional likelihood for

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[1] According to the *Population Census of Japan 2000* (Statistical Bureau 2001), the proportion of widowed and divorced among single women aged 20-34 is 4.4%. By excluding single women with children from our analysis, the proportion of ever-married women in our analytical sample is considered to be similar or, at best, smaller than this figure.

estimating the parameters (Cleves et al. 2008). In this way, our parameter estimates are considered free from selection bias due to the late entry of the left-truncated samples. However, the results obtained in this analysis cannot be applied to teenage marriage or marriages of other cohorts. In observing less than entire marriage behaviors of the objective cohort, our analysis implicitly assumes that the left-truncated marriage behaviors of older cohort members are identical to, or at least not much different from, observed marriage behaviors of younger cohort members. Similarly, observed marriages behaviors of older cohort members are assumed to be close to those among right-censored younger cohort members. This may be rather a strong assumption, but it is to some extent unavoidable for any cohort panel survey unless it covers the entire risk periods of marriage under study.

The analyses are conducted by the discrete-time hazard model (Allison 1982). In this model, the logit of first marriage at a given age is estimated as a function of women's education, annual wages, age, period, occupational status, living arrangements, and local-level SMAM (singulate mean age at marriage) in 2002. The local-level SMAM in 2002 is linearly imputed from the official statistics of the prefectural SMAM in 2000 and 2005[2] (NIPSSR 2009). Except for the SMAM in 2002, all covariates are measured as time-varying covariates. The values of these time-varying covariates are used at the time of (t-1) year to explain that the marriage occurred between (t-1) and (t) year. As the annual wages of the previous year are recorded in each wave, wages are actually measured at (t-2) year[3]. There are no missing values in period or SMAM in 2002. However, samples, which have a missing value in age, sex, marital status, or educational level, are excluded from the analysis.

In addition, the percentage of women who graduated only from junior high school, the compulsory level of education, is very low: just 2.2% of our analytical sample. Due to the difficulties in obtaining stable estimates of the least-educated group, and their presumably deviant marriage patterns such as a high tendency of premarital pregnancy (Raymo and Iwasawa 2008), they are excluded from our analyses. The general interpretations of the estimated results are, however, not affected by their deletion. We therefore differentiate between the following educational levels: 1) high school (12 years of education), 2) vocational school (11 or 14 years of education), 3) two-year junior college (14 years of education), and 4) four-year university or graduate school (16 or more years of education). Respondents are assigned to the various educational levels based on graduation. The only exceptions occur when the respondents are currently enrolled in education; in these cases, respondents are assigned to the education level in which they are currently enrolled.

Due to their relatively large proportion, missing values of wage, occupation, and living arrangements are imputed to retain sample size. The sex- and period-specific mean wage is assigned for the missing or zero wages. A dummy variable that indicates that wages are imputed is additionally created. The parameter of the imputed-wage dummy variable therefore indicates the risk of marriage among non-wage-earning or

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[2] In the LSYA21, respondents' prefectures of residence are not provided after the first wave survey.
[3] It may be possible to use the wage at (t-1) year. In that case, however, wages of censored women are not obtained. Therefore, to retain censoring cases into the sample until the last year of the observation, wage at (t-2) was used.

missing-wage women relative to that of women with mean wages. A missing value category is created for missing occupation status and living arrangements. Unmarried cohabitation is not distinguished as a separate category of living arrangements since the LSYA21 asked about the presence of an unmarried partner only in the first and the second wave of the survey and only slightly less than 2% of our analytical samples are identified as cohabiting with a partner[4]. As a result of these sample selections, the analytical samples are reduced from 7,888 to 7,654 single women. They are followed until they marry, drop out of the survey, or reach the fifth wave of the survey without marrying. For a maximum of four years of observation, the total number of women at risk of first marriage is 22,883. The descriptive statistics of events and covariates are shown in Table 1.

Table 1.   Descriptive Statistics

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[4] In the age group 18-34, proportions of never-married who are in consensual union are 1.9% and 2.3% for men and women, respectively, in 2005 (NIPSSR 2007b). Therefore, the low incidence of cohabitation in the LSYA21 is accurate and not due to the under representation of unmarried women in cohabitation.

Variable	mean	sd
Decrement		
Single	0.82	-
Married	0.05	-
Attrition	0.13	-
Age		
20-23	0.18	-
23-26	0.28	-
26-29	0.23	-
29-32	0.17	-
32-35	0.11	-
35-38	0.03	-
Period		
2002-2003	0.33	-
2003-2004	0.27	-
2004-2005	0.22	-
2005-2006	0.18	-
Educational Attainment		
High school	0.29	-
Vocational school	0.19	-
Junior College/Technical school	0.25	-
University/Graduate school	0.27	-
Occupational Status		
Full-time employee in a large company	0.11	-
Full-time employee in a small/middle sized company	0.20	-
Skilled Worker	0.14	-
Self-employed/Family Worker	0.03	-
Non-standard Employee	0.27	-
Unemployed	0.08	-
Student	0.10	-
Missing	0.07	-
Ln(Yearly Wage) (10,000 Yen)	5.20	0.72
Yearly Wage zero or Missing	0.22	-
Living Arrangements		
Living Away from Parents	0.11	-
Living with Parents	0.68	-
Living with One Parent	0.11	-
Missing	0.10	-
Prefectural SMAM in 2002 (minus 28)	0.89	0.64

In discrete-time models, parameter estimation is accurate only when the likelihood functions of competing events are simultaneously calculated (Allison 1982). This is especially true when the probabilities of competing events are considerable. Due to the modest, but not negligible, level of attrition, it is not appropriate to treat attrition as right censoring in the analysis. Table 2 shows the occurrences of marriage and attrition in the analytical samples. The attrition rates in a risk population are around 15% in each age, while corresponding marriage occurrences are 2%-7%. To avoid the possibility of a severe bias in the parameter estimates of marriage risks, attrition is treated as a competing event in the analysis. A multinomial logit model is applied to the data of first marriage. The decrements from the risk population of

first marriage are either first marriage or attrition in the models. The models simultaneously estimate parameters for hazards of marriage and attritions that refer to remaining single in the risk set. Only absence of marriage until the fifth wave survey is treated as censoring. In this way, the parameter estimates for first marriage are assumed to be stochastically independent from the occurrences of attrition over marriage processes. The parameter estimates of the attrition are not shown in the paper, however, since they are not relevant to our hypothesis testing.

Table 2.   Occurrences of Marriage and Attrition by Age Group

Age[a]		Never-Married→ Never-Married	Married	Attrition	Total
20-23	n	3335	86	605	4026
	%	82.8	2.1	15.0	100.0
23-26	n	5398	291	824	6513
	%	82.9	4.5	12.7	100.0
26-29	n	4185	380	696	5261
	%	79.6	7.2	13.2	100.0
29-32	n	2993	249	548	3790
	%	79.0	6.6	14.5	100.0
32-35	n	2068	118	308	2494
	%	82.9	4.7	12.4	100.0
35-38	n	672	29	98	799
	%	84.1	3.6	12.3	100.0
Total	n	18651	1153	3079	22883
	%	81.5	5.0	13.5	100.0

a: Age is measured at the time of the survey, in November in every year.

4. Models

The model estimations are done in two different ways. In the first analysis, four nested models are run to examine the effects of women's educational levels and the interventions of occupational status, wages, and control variables. The models are mathematically expressed as follows:

M1: $\ln(p_{jt}/(1 - p_{jt})) = \alpha_j + \beta_{j1}\text{Age}(t-1) + \beta_{j2}\text{Period}(t-1) + \beta_{j3}Educ(t-1) + \beta_{j4}Educ(t-1) \times Age(t-1)$.

M2: $\ln(p_{jt}/(1 - p_{jt})) = \text{Model1} + \beta_{j5}Occupation(t-1)$.

M3: $\ln(p_{jt}/(1 - p_{jt})) = \text{Model2} + \beta_{j6}Wage(t-2)$.

M4: $\ln(p_{jt}/(1 - p_{jt})) = \text{Model3} + \beta_{j7}Controls(t-1)$

In Model 1 (M1), age, time period, education, and the interaction of age and education are incorporated into the model as covariates. Age serves as a baseline time axis for the models, and is used as a dummy variable of three-year age groups. To control for the period variations, dummy variables of a single-year period between 2002 and 2005 are included. Previously, age patterns of marriage have found to differ significantly by educational level (Tsuya and mason1995; Raymo 2003b). Therefore, not only

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covariates on education, but also the interaction of education and age, are included in Model 1.

Other economic variables, namely current occupational status and previous wages, are sequentially included in Model 2 (M2) and Model 3 (M3), respectively. The current occupation measures the levels of human capital, while wages provide a direct measure of the level of a woman's economic independence. Sequentially including them in the model allows us to examine how women's human capital investments and current levels of economic independence explain the educational differentials in age patterns of marriage. Finally, in Model 4 (M4), control variables, such as women's living arrangements and prefectural SMAM, are added in order to see if the effects of these explanatory variables are independent of the control variables.

In testing the economic independence hypothesis, negative effects on marriage hazards can be expected from women's high educational levels, skilled jobs, and high wages. In testing the spouse-search hypothesis, however, it is necessary to examine the effects of these economic variables on marriage timing. The spouse-search hypothesis assumes that women's economic resources increase women's chances of marriage in general, and that the effects will be more pronounced in later marriages than in marriages that take place at younger ages (Oppenheimer 1988). To test the spouse-search hypothesis properly, the models need to be able to distinguish between whether women's economic qualifications affect early or later marriages.

To detect the age-dependent effects of women's economic variables, a second series of models are run separately by two age groups. The samples are divided into two groups, ages 20-25 and ages 26-37, at a given risk period (t-1). The division of the two age groups is made a posteriori from a result of the nested model of first marriage, which is shown in the next section. In the age-divided models, effects of women's economic variables are estimated separately in younger and older age groups. Therefore, it is possible to discern in which age groups their effects are more pronounced. Ages are divided into two-year groups, and used as dummy variables. Education is assumed to have proportional effects on the hazard odds during the risk ages in each model. Therefore, the interaction term of educational levels and age is not included in the models. Two nested models for each age group are constructed as well: one without wage variables, and the other with wage variables.

5. Results
5-1. Kaplan-Meier Survival Analysis

Before moving to the multi-variate analysis, the relationship between women's education and first marriage is displayed by the graphical representation of the Kaplan-Meier survival curves in Figure 2[5].

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[5] It is generally not recommended to calculate Kaplan-Meier survival estimates with time-varying covariates (Hoem and Kreyenfeld 2006). In Japan, however, educational mobility after graduating from the last continuous education is not frequent. With a given definition of education variable in this data, more than 99% of analytical samples retain the same educational attainment across waves. Therefore, it is felt that the use of education variable would not be harmful in the estimation result in Figure 2.

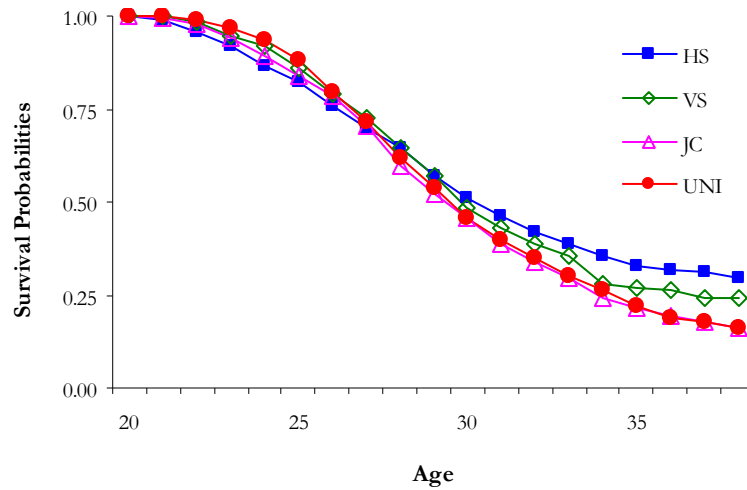**Figure 2.　Kaplan-Meier Survival Estimate of First Marriage, by Education**

Figure 2 shows clear differences in both timing and levels of marriage by educational levels, but in a manner that appears to contradict the findings of the previous studies. In their early twenties, women with less than post-secondary education, such as high school, marry slightly sooner than women with post-secondary education. In the second half of their twenties, marriage intensities among women with post-secondary education catch up rapidly with those of women with lower levels of education. As a result, the estimated proportions of those never married become lower among women with high levels of education than among high school graduates. Subsequently, the gaps in marriage intensities grow larger as women with junior college and university education marry at higher rates at later ages than other educational groups.

The rates of non-marriage at the age of 38 are estimated at about 30% for high school graduates, 24% for vocational school graduates, and 16% for both junior college and university graduates. The estimated non-marriage rates of junior college and higher educated women are statistically different from those of high school graduates at 5% levels. These results positively support the spouse-search hypothesis, rather than the economic independence hypothesis at glance. Thus, the LSYA21 data suggest that marriage trends among highly educated women may be turning around. In the next step, the multi-variate analysis further investigates which factors explain the educational differences in marriage intensities.

5-2. Nested Models

Table 3 displays estimation results from Model 1 to Model 4. The models are nested within each other, so that the changes in the magnitudes and statistical levels of parameters throughout the models are directly interpreted as a result of the inclusion of the new variables. Furthermore, as is shown in Figure 2, the age patterns of marriage significantly differ by educational group. This result justifies the use of the models with time-dependent effects of education during the risk age for marriage.

Table 3. Odds Ratios from Discrete-time Multinomial Logit Models of First Marriage

Variable	Model 1	Model 2	Model 3	Model 4
Period (ref. Year 2002- 03)				
2003- 04	1.12	1.11	1.09	1.09
2004- 05	1.22 *	1.20 *	1.16 †	1.16 †
2005- 06	1.16 †	1.16	1.13	1.12
Age (ref. 23-26)				
20-23	0.69 †	0.70 †	0.71 †	0.70 †
26-29	1.24	1.25	1.23	1.23
29-32	1.04	1.04	1.01	1.01
32-35	0.65 *	0.65 *	0.63 *	0.64 *
35-38	0.30 **	0.30 *	0.29 **	0.30 **
Educational Attainment (ref. High school)				
Vocational school	0.82	0.77	0.76	0.79
Junior college	0.78	0.74 †	0.72 *	0.74 †
University/graduate school	0.80	0.82	0.85	0.93
Occupational Status				
(ref. Full-time employee in a small/middle sized company)				
Full-time employee in a large company	-	0.91	0.87	0.89
Skilled Worker	-	1.22 *	1.18 †	1.17
Self-employed/Family Worker	-	1.07	1.13	1.15
Non-standard Employee	-	0.88	0.96	1.00
Unemployed	-	0.86	1.04	1.08
Student	-	0.44 ***	0.52 **	0.54 **
Unknown	-	1.14	1.20	1.21
Log of Yearly Wage (10,000 Yen)	-	-	1.22 ***	1.25 ***
Yearly Wage 0 or Missing	-	-	0.71 ***	0.69 ***
Living Arrangements (ref. Living with Parents)				
Living Away from Parents	-	-	-	1.08
Living with One parent	-	-	-	1.11
Unknown	-	-	-	1.15
Prefectural SMAM in 2002	-	-	-	0.75 ***
Education * Age				
VS * 20-23	0.63	0.74	0.80	0.81
VS * 26-29	1.42	1.41	1.39	1.41
VS * 29-32	1.76 *	1.78 *	1.76 *	1.79 *
VS * 32-35	1.78 †	1.77 †	1.75 †	1.76 †
VS * 35-38	1.52	1.53	1.49	1.51
JC * 20-23	0.91	0.98	1.06	1.09
JC * 26-29	1.54 †	1.55 †	1.55 *	1.55 *
JC * 29-32	1.72 *	1.78 *	1.74 *	1.77 *
JC * 32-35	1.95 *	2.01 *	1.95 *	1.97 *
JC * 35-38	4.55 **	4.54 **	4.39 **	4.57 **
UNI * 20-23	0.35 **	0.62	0.65	0.67
UNI * 26-29	1.57 *	1.47 †	1.35	1.33
UNI * 29-32	1.69 *	1.58 †	1.43	1.40
UNI * 32-35	2.22 **	2.05 *	1.81 †	1.77 †
UNI * 35-38	4.26 *	3.88 *	3.36 *	3.27 *
Constant	0.06 ***	0.06 ***	0.02 ***	0.02 ***
n	7657	7657	7657	7657
n of person-year	22883	22883	22883	22883
n of events	1153	1153	1153	1153
Chi-square	335.05	402.27	487.78	937.01
d.f.	52	66	70	78

Note: Parameter estimates for attrition are not shown in the table.

† p<.10; * p<.05; ** p<.01; *** p<.001

Model 1 generally confirms the findings of Figure 2, the education-specific trends of marriage intensities. Compared with high school graduates, women with post-secondary education are more likely to accelerate their transitions to marriage later. On the other hand, early marriages in the first half of their twenties are less likely among university-educated women, mainly due to enrollment in education. To illustrate the findings, the shape of the baseline hazard functions is displayed by educational levels in Figure 3 in the form of relative risks.

Figure 3. Relative Risks of First Marriage by Education and Age
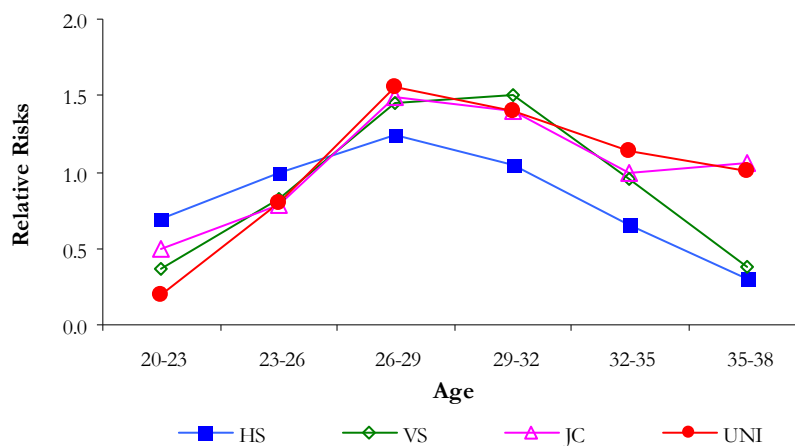

In Model 2, occupational status is included in the model. As expected, being a student significantly lowers the risk of marriage. Since the interaction effect of university and ages 20-23 lost its statistical significance in Model 2, enrollment in education almost entirely explains the low marriage risks of university-educated women in their early twenties. On the other hand, women with skilled jobs have significantly higher chances of marrying than women who work as full-time employees in small or medium-sized companies. Therefore, women with more human capital are more likely to marry. Note also that the positive effects of interactions between university education and later ages are much reduced from those in Model 1.

It is interesting to note that occupational status has an intervention effect upon age patterns in marriage among university-educated women, but not for patterns among women with other forms of post-secondary education. As Raymo (1998) has suggested, this is evidence that women with university degrees possess higher labor market assets than do graduates of junior colleges or vocational schools. The fact that women with skilled jobs are more likely to marry also supports the spouse-search hypothesis.

In Model 3, wage variables are included in the model. Women's annual wages have a positive, non-linear effect on marriage hazard. The effect of the wages is shown in Figure 4. The broken lines show percentiles of wage distribution in the analytical samples. Although the curve of the income effect is steeper in lower wages, it shows a moderate but continuous increase at higher wages as well. Using relatively small non-probabilistic samples, previous studies have found either logarithmically negative (Higuchi 2001; Ono

2003) or inversed U-shaped effects (Fukuda 2007) of women's income on marriage hazards. Those results are interpreted as either full or partial supports for the women's economic independence hypothesis, as postulated by Becker (1981). Our findings, however, suggest that economically independent women are more likely to marry. Thus, the spouse-search hypothesis, which assumes that women's economic resources are a positive qualification for marriage, is more applicable to recent marriages than the economic independence hypothesis.

Figure 4.   Relative Risks of First Marriage by Annual Wages
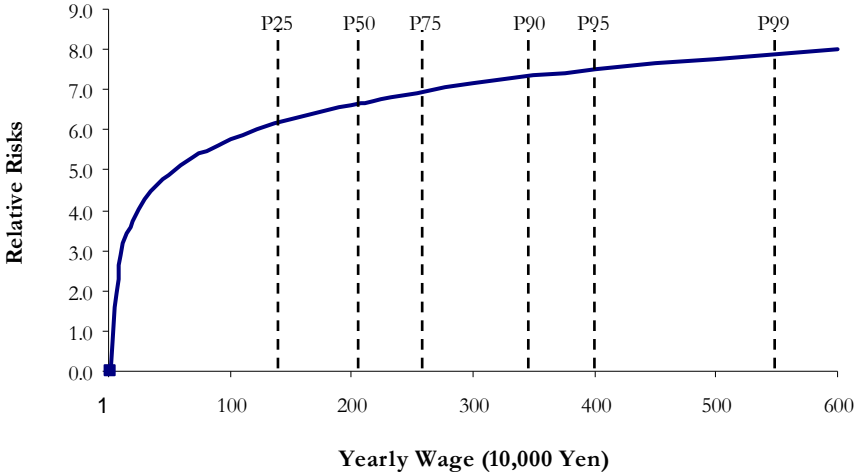
Note: The dashed lines indicate percentiles of wage distribution in the analytical sample.

The inclusion of wage variables also affects the education-specific age patterns of marriage. In Model 4, the late marriage tendency of university-educated women has further diminished. Therefore, the recovery in marriage rates among university-educated women at later ages can also be explained by the increase in marriage rates among high-earning women. For similar reasons, the positive effect of having a skilled job is also reduced once wage variables are added to the model. Women with skilled jobs are more likely to marry, partially due to their higher levels of economic independence. These explanations are again in line with the spouse-search hypothesis.

In contrast to the trends seen among university graduates, the age patterns of marriage among junior college and vocational school graduates do not change much after including the wage variables. This means that the high marriage tendency among junior college or vocational school women cannot be explained by women's current levels of economic resource. As university education is gaining in popularity among women, those who attend junior college rather than university are considered to be less career-oriented, and more likely to hold traditional values regarding family roles than their peers who attend university (Raymo and Iwasawa 2005). Therefore, their marriage patterns are less affected by their levels of economic independence.

Finally, in Model 5, control variables such as living arrangements and the prefectural SMAM, are

included in the model. This eliminates the positive effect of a skilled job, but does not change the relationship between women's economic variables, such as education, wage, and marriage intensities. Of the control variables, only prefectural SMAM has a strong positive effect on marriage formation, as it represents the intensities of the local marriage market. Therefore, women who live in a prefecture where the SMAM is high—that is, marriage occurs less frequently in their local marriage market—are less likely to marry. This result implies that there are significant regional variations in marriage behaviors of Japanese women.

5-3. Age-Divided Models

Table 4 shows the estimation results for the age-divided models. Here the samples are divided into two groups according to their ages: older or younger than age 26 at the time of marriage or censoring. Two nested models, one including wage variables, are estimated for each age group. Age 26 is chosen as a dividing point because the education-specific age patterns of marriage change after this age (see Figure 3). The models clearly show the age-dependent effects of each covariate.

The effects of occupation status have strong age dependency in relation to marriage formation. Since occupational effects may be confounded by the inclusion of wage variables, only results from Model 5 and Model 6 will be interpreted. According to these models, women who are students or working as non-standard employees are less likely to marry at younger ages than the reference women. Unemployed women also have a low risk of early marriage, though the risk is not statistically significant. When we look at the marriages that occur in the late twenties and the thirties, however (Model 6), we find that women with skilled jobs have a distinctly higher risk of marrying than the reference women. These results suggest that women with high levels of human capital, such as skilled workers, are more likely to marry in their late twenties, presumably after achieving certain career status. This tendency is consistent with the interpretation of the spouse-search hypothesis. Being unemployed, a student, or a non-standard worker does not affect marriage rates at later ages. In general, the occupational gradients in marriage risks attenuate at older ages.

In Model 7 and in Model 8, wage variables are added. The effects of women's wages are slightly stronger in later marriages, though the general pattern of the income effects is consistent. In Model 7, holding education and wage levels constant, we find that women who work for a large company have slightly lower risks of marriage in their early twenties than women in the reference group. Women who work for a large company may have a higher degree of salary and benefit, and thus more commitment to the work than those who work for a smaller company. Therefore, if wage levels are constant across the size of companies, their chances of early marriage are slightly smaller than those of the reference women. In Model 8, the positive effect of a skilled job is weakened slightly by inclusion of the wage variables. The effect remains significant at 10% levels. Therefore, it is implied that, in addition to income, career development also matters for the timing of marriage of skilled female workers.

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Table 4. Odds Ratios from Discrete-time Multinomial Logit Models of First Marriage, by Age Group

Variable	Age 20-26 Model 5	Age 26-38 Model 6	Age 20-26 Model 7	Age 26-38 Model 8
Period (ref. Year 2002‑03)				
2003‑04	1.25	1.02	1.24	1.01
2004‑05	1.36 *	1.09	1.32 †	1.06
2005‑06	1.17	1.12	1.13	1.10
Age				
20-22	0.54 **	-	0.60 *	-
22-24	0.67 ***	-	0.70 **	-
24-26 (omitted)	1.00	-	1.00	-
26-28	-	2.02 ***	-	2.11 ***
28-30	-	2.20 ***	-	2.27 ***
30-32	-	1.84 ***	-	1.86 ***
32-34	-	1.51 *	-	1.53 *
34-38 (omitted)	-	1.00	-	1.00
Educational Attainment (ref. High school)				
Vocational school	0.74 †	1.28 *	0.74 †	1.25 †
Junior college	0.75 †	1.36 **	0.74 *	1.30 *
University/graduate school	0.89	1.43 ***	0.93	1.34 **
Occupational Status				
(ref. Full-time employee in a small/middle sized company)				
Full-time employee in a large company	0.73	1.06	0.70 †	1.00
Skilled Worker	1.05	1.32 *	1.03	1.27 †
Self-employed/Family Worker	0.74	1.23	0.77	1.33
Non-standard Employee	0.73 *	1.02	0.79	1.14
Unemployed	0.68	1.00	0.82	1.22
Student	0.21 ***	0.83	0.26 ***	1.00
Unknown	1.10	1.17	1.15	1.23
Log of Yearly Wage (10,000 Yen)	-	-	1.21 *	1.28 ***
Yearly Wage 0 or Missing	-	-	0.66 **	0.73 *
Living Arrangements (ref. Living with Parents)				
Living Away from Parents	1.14	1.10	1.11	1.06
Living with One parent	1.03	1.13	1.04	1.12
Unknown	1.13	1.01	1.25	1.10
Prefectural SMAM in 2002	0.75 **	0.76 ***	0.75 **	0.75 ***
Constant	0.09 ***	0.04 ***	0.03 ***	0.01 ***
n	4222	4734	4222	4734
n of person-year	10539	12344	10539	12344
n of events	377	776	377	776
Chi-square	476.26	364.01	502.92	400.93
d.f.	38	42	42	46

Note: Parameter estimates for attrition are not shown in the table.

† p<.10; * p<.05; ** p<.01; *** p<.001

6. Summary and Discussion

Using the largest panel survey to date on young adults in Japan, the results of this study showed that, in recent cohorts in which post-secondary education among women is becoming the norm, a woman's high earning potential leads to a greater likelihood of marrying. The analysis revealed that having a university education and a skilled job facilitates marriage at later ages, and that higher-earning women are more likely than are lower-earning women to marry at any age. Furthermore, the analysis showed that women with junior college or university degrees are now expected to have a higher likelihood of having ever been married at the age of 38 than high school-educated women. Our results show that women with high earnings potential are more marriage-oriented than their less economically advantaged counterparts. Therefore, this study concludes that marriage behaviors of Japanese women are best explained by the spouse-search hypothesis, which assumes that women's economic resources serve as positive qualifications for marriage. This implies that Japanese marriage patterns might soon resemble those of Western countries, such as the US, Australia, and Sweden, where women with high earnings potential are more likely to marry than those with low earnings potential (Bracher and Santow 1998; Oppenheimer and Lew 1995; Ono 2003; Santow and Bracher 1994; Sweeney 2002).

This study proposed that the answer to the question of whether the economic independence hypothesis or the spouse-search hypothesis is more clearly supported depends on the economic foundation of marriage. By supporting the spouse-search hypothesis, these findings imply that the traditional breadwinner role of men is changing among young married couples in Japan. The changes in the relationship between women's earnings potential and marriage formation can be seen as a process of social change. The shift in the explanation of Japanese marriage from the economic independence hypothesis to the spouse-search hypothesis parallels the social changes suggested by other scholars who described the developmental changes in women's economic emancipation (Goldin 2006), and the changes in wives' career development (Blossfeld and Drobnic 2001). In fact, a recent survey shows that, among younger marriage cohorts in Japan, growing numbers of women continue to work after marriage (Iwasawa 2004). Over the last two decades, the male-breadwinner family type has increasingly fallen out of favor among Japanese couples, due to such factors as the universalization of tertiary education and women's improved labor market positions. Previous studies have emphasized the gender asymmetric features of Japanese society to explain the negative consequences of women's economic contributions on family formation outcomes (Tsuya and Mason 1995; Raymo 2003b; Ono 2003; Raymo and Iwasawa 2005). However, the shift in the role of women's economic resources in marriage formation might indicate that the economic foundation of marriage in Japan has begun to shift from the male-breadwinner to the dual-earner types.

This shift may also be driven by ideological factors unobserved in this study. For example, women's educational upgrading and the subsequent marriage squeeze among women with higher education might lead to changes in women's requirements regarding the educational qualifications of their husbands. Raymo and Iwasawa (2005) pointed out that this marriage squeeze is, largely, due to women's unchanged views on female-status hypergamy, which stems from the traditional gender-divided roles of spouses. However,

when facing the continuingly limited supply of potential partners, highly educated women may consider preference alterations in spouse selection, breaking away from the social norms that discourage women from marrying men with lower education (Blossfeld and Timm 2003) resulting in the relaxing of standards regarding hypergamy among women. The time-series trend of educational pairings in couples supports this view by showing the increase in educationally hypogamic spouse choices among women (NIPSSR 2007a). Furthermore, the study by Raymo and Iwasawa (2008) indicates that the growing trend of "shotgun marriage" in Japan is contributing to the increase in women's hypogamy, as women whose marriages are preceded by pregnancy are more likely to marry a less educated man (Raymo and Iwasawa 2008). In their analysis, this association is most pronounced in the most recent marriage cohort (1990-2002).

Another factor in the ideological change towards the dual-earner family may be the lower economic status of men due to the economic downturn of the 1990s. During this period, employment among young adults became increasingly insecure (Genda and Kurosawa 2001; Kosugi 2001). Youth unemployment rates reached a record high, and many high school and university graduates could get only part-time or contract-based jobs, which often do not provide the benefits of a full-time position. The sense of lowered economic status could be marked, especially among men lacking higher education. As a result, the ideology of the male-breadwinner family is much weaker among the younger generation, and women's economic qualifications have become a more important factor for young couples considering marriage.

Third, the increase in a nuclear family lifestyle among newlyweds may be contributing to the trends towards dual-earner family. Japan has been historically had a strong stem-family tradition. Until the 1950s cohort, it was expected that heir sons or heir daughters form an extended family household by including their wife or husband after marriage (Fukuda 2009). However, since the 1960s cohort, an increasing number of young adults leave home to form a separate household from their parents at marriage, regardless of their heir status (Fukuda 2009). As a result, the number of nuclear households among married young adults aged 20-34 increased from 70.5% in 1985 to 83.5% in 2005 (author's calculation based on the Population Census of Japan). As the nuclear family is becoming a more common choice, it is possible that wives' economic contribution to the household will become more important to maintain the couples' standard of living. Further, Oppenheimer (1997) argues that in nuclear family settings, family stability is more risky and fragile in gender-role specialized marriages than dual-earner's marriages. In the specialization model of marriage, the substitutability between spousal roles is low. When one of the spouses is not able to perform his or her specialized role for such reasons as sickness or unemployment, it becomes difficult for them to sustain their family. Therefore, the shift in the economic foundation of marriage may be due to the anticipation of such risks among young couples that are under the increasing sense of economic uncertainty since the 1990s recession.

Finally, a comment on the results of this study, and discussion of future areas of study for marriage and fertility research in Japan. It is expected that the positive relationships between women's economic resources and marriage formation presented here will continue, or even accelerate, in the period of economic slowdown in which the Japanese and the rest of the world currently find themselves. Levels of

enrollment in tertiary education are expected to remain at current levels, since the demographic supply of high school graduates is rapidly shrinking due to recent fertility decline. In addition, lower economic status among young men should reinforce the trend towards the dual-worker family, while rendering the single-income family model less valid. Women's economic resources are becoming more important for young couples considering marriage. For this reason, it is felt that this study has captured the very beginning of this behavioral change, and the data used here are eminently functional in observing and describing the social changes currently taking place among young adults in Japan.

Note that the reversal in the effects of women's economic qualifications on marriage hazards does not necessary mean that there will be an increase in nuptial levels among highly educated women, or in overall marriage rates. In fact, period statistics show that marriage rates continue to decline. For example, in the period between 2000 and 2005, women's age-specific first marriage rates (five-year-old age group) among those never married under the age of 35 are declining (NIPSSR 2009). Causes of decline in both education-specific and overall marriage rates should be examined using data that covers marriage behaviors of multiple cohorts. Furthermore, this study examined only the marriage behaviors of women. To draw a complete picture of marriage behaviors in Japan, the marriage behaviors of men need to be explored as well. Studies on men's marriage behaviors are very scarce in Japanese demography, with only a few extant, such as Otani (1993), Kato (2004), and Raymo (2003a). Such a study now has a significant appeal, as the theory of assortative mating, upon which the spouse-search hypothesis is based, places considerable emphasis on the importance of men's marriageability in explaining women's marriage trends (Oppenheimer 1988, 2003; Oppenheimer, Kalmjin and Lim 1997).

The implications of the reversal in marriage trends among highly educated women should also be considered in relationship to overall marriage trends. These findings might suggest that despite of the shift in the economic foundation of marriage, gender relationships are, in general, still traditional in Japan. It is possible that the majority of young adults are still postponing marriage due the conflict between economic prospects and the traditional ideology of the male-breadwinner family, or women's avoidance of the gender-traditional division of childcare and household tasks. As a result, young adults currently marrying are more likely to be a group of people less inclined to favor the traditional idea of marriage; or, contrarily, it is possible that marriage-inclined women in the recent period are those who have high earnings potential, but who also hold traditional gender-division values regarding childrearing and household production. In either case, it is safe to say that role of the wife as a secondary provider is now largely and more positively accepted by young couples in Japan, just as in Western countries. The speculation here is consistent with the general trend of changes in gender divisions of labor in developed countries: wives' involvement with market labor is found at a higher degree than men's involvement with child care and household chores (Hochschild and Machung 1989; Shelton and John 1996; Blossfeld and Drobnik 2001). Some scholars see the increase in men's involvement with family as a key factor to increase levels of fertility in gender asymmetric countries such as Japan and Southern European countries (Feyrer, Sacerdote and Stern 2008). Further investigation is necessary on the issue of allocation of bargaining power between spouses, and its

relationship to fertility.

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