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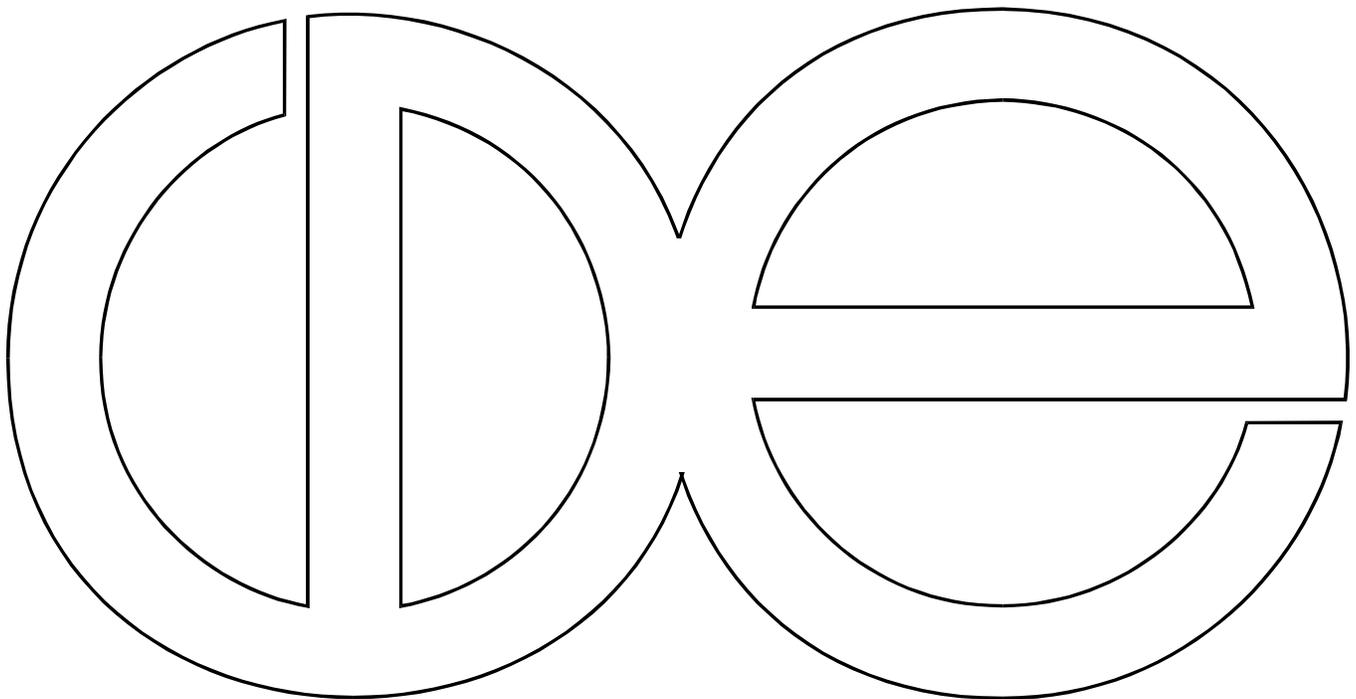
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Economic Independence or Marriage Market Mismatch? An alternative view of the relationship between women's education and marriage in Japan

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Abstract

Results from cross-national research suggest that increasing economic independence for women contributes to lower rates of marriage only in societies characterized by relatively asymmetric gender division of domestic and market labor. We develop and evaluate an alternative theoretical scenario in which the same results could be explained by changes in marriage market composition and women's continued dependence upon men's economic resources. Using data from four recent surveys, we examine how changes in Japanese marriage rates reflect changes in the general propensity to marry, the likelihood of particular pairings, and composition of the marriage market with respect to age and educational attainment. Construction of counterfactual marriage rates and synthetic cohort marriage trajectories indicates that changes in marriage market composition due to relative improvements in women's educational attainment have contributed to lower rates of marriage among highly educated women and higher rates of marriage among less educated women. Net of this compositional effect, decline in the general propensity to marry among highly educated women has actually been smaller than among high school graduates. Explicit consideration of change in the feasibility of marriage thus results in a fundamentally different theoretical interpretation of decline in the relative risk of marriage for highly educated women.

Economic Independence or Marriage Market Mismatch?

An alternative view of the relationship between women's education and marriage in Japan

Introduction

Explanations for the trend toward later marriage in industrialized countries often emphasize the growing economic independence of women (see Oppenheimer 1997 for a thorough review of related literature). The "economic independence hypothesis" is intuitively and ideologically appealing (Oppenheimer 1994), but its predictions of a negative relationship between women's educational attainment (a common proxy for economic potential) and the risk of marriage has received only limited empirical support. In the U.S., for example, recent studies have consistently shown the relationship between women's educational attainment and the likelihood of marriage to be positive or insignificant (e.g., Goldstein and Kenney 2001; Oppenheimer and Lew 1995; Sweeney 2002; Thornton, Axinn, and Teachman 1995). Similar results have been found in other countries, including Sweden (Bracher and Santow 1998) and Germany (Blossfeld and Huininck 1991). Evidence consistent with the economic independence hypothesis has been found only in select countries such as Italy (Pinelli and DeRose 1995) and Japan (Raymo 2003, Tsuya and Mason 1995).[1]

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[1] A similar pattern of regional variation is observed in analyses using other indicators of women's economic resources such as earnings and employment. Women's economic resources are positively or insignificantly associated with marriage in the U.S. (e.g., Sweeney 2002; Xie, Raymo, Goyette, and Thornton 2003;), Sweden (Ono 2003), and Australia (Santow and Bracher 1994), but negatively associated with marriage in Japan (Ono 2003).

Sociologists have attributed these regional differences to gender context, arguing that the theoretically expected negative relationship between marriage and women's educational attainment (or other indicators of economic potential) may hold only in settings where gender asymmetry in the division of domestic labor makes it difficult for women to balance work and family (e.g., Blossfeld 1995). In societies such as Japan, where gender specialization is a basic feature of marriage and husbands perform minimal domestic labor (Tsuya 2000; Tsuya and Mason 1995), relative improvements in women's economic opportunities are thought to reduce the gains to marriage. In societies such as the U.S., where husbands' and wives' economic roles are increasingly similar, the opportunity costs and risks associated with marriage are thought to be lower (Oppenheimer 1994). By increasing the importance of women's economic potential as a spouse selection criterion (Sweeney and Cancian 2004), convergence in the gender division of labor within the family has contributed to an increase in educational homogamy (e.g., Mare 1991) and an increasingly positive relationship between women's educational attainment and the risk of marriage (e.g., Goldstein and Kenney 2001). This view of the "shifting economic foundations of marriage" (Sweeney 2002) suggests that the relationship between women's educational attainment and marriage is most likely to be negative when relative improvements in women's economic opportunities are not accompanied by convergence in men's and women's and women's economic roles within the family.

This interpretation of the empirical evidence has great intuitive appeal but it is important to recognize the limitations of the research upon which it is based. To date, most relevant work has focused either implicitly or explicitly on the relationship between women's educational attainment and the *desirability* of marriage, paying little or no attention to potential changes in the *feasibility* of marriage. There are, however, compelling theoretical reasons to expect that

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women's educational attainment may be negatively related to the risk of marriage even if the gains to marriage are unrelated (or positively related) to education. In particular, relative improvements in women's educational attainment that are not accompanied by a convergence in the criteria with which men and women evaluate the educational attainment of potential spouses may generate a "marriage market mismatch," increasing the numerical difficulty that highly educated women (and less educated men) face in locating a "suitable" spouse.

Unfortunately, however, the analytical approach typically employed in evaluations of the economic independence hypothesis does not allow researchers to make distinctions between reductions in the gains to marriage and mismatches in the marriage market. By comparing the risk of marriage for highly educated women relative to that for less educated women (Blossfeld ed. 1995; Raymo 2003), researchers typically assume that mechanisms of change (i.e., reductions in the gains to marriage) influence women at all levels of education in the same direction but with different strength. This assumption of unidirectionality is certainly plausible for changes in the desirability of marriage but not for changes in the feasibility of marriage. A decline in the ratio of women to men at higher levels of education due to relative improvements in women's educational attainment implies, by definition, an increase in the sex ratio at lower levels of education. Assuming relatively stable educational pairing preferences, a less advantageous marriage market for highly educated women therefore implies a more advantageous marriage market for less educated women. The theoretical implications of this marriage market mismatch scenario are thus identical to those of the economic independence hypothesis - a decline in the relative risk of marriage for highly educated women.

The observed negative relationship between women's educational attainment and marriage in relatively gender inegalitarian societies such as Italy and Japan may therefore reflect

reductions in either the desirability or the feasibility of marriage, or some combination of both. However, these two theoretical scenarios imply fundamentally different processes of social change. The first scenario suggests that women's increasing economic resources are used to either delay or avoid entry into marriages characterized by highly asymmetric work and family roles. The basic theoretical premise underlying this scenario is that women's increasing educational attainment has resulted in a decline in the gains to marriage (i.e., an increase in the opportunity costs of marriage). The desirability of marriage based on gender specialization thus declines as women's economic opportunities improve relative to those of men. The second scenario suggests that women's increasing educational attainment results in later marriage for essentially the opposite reason. Because the desirability of female status hypergamy (male status hypogamy) continues to be strong when economic roles within the family remain sharply differentiated by gender, convergence in the educational attainment of men and women decreases the relative size of the pool of "attractive" partners for highly educated women (and for less educated men). The numerical feasibility of marriages based on gender specialization thus declines in response to relative improvements in women's educational attainment and the associated expansion of women's economic opportunities. Simply stated, later marriage for highly educated women reflects women's increasing economic independence from men in the first scenario and women's continued economic dependence on men in the second scenario.

A second fundamental difference between the two scenarios is the role of men. The first scenario attributes declining rates of marriage primarily to changes in women's views of marriage whereas the second scenario emphasizes the stability of spouse selection preferences among both men and women. Interpretation of the observed negative relationship between women's educational attainment and marriage in relatively gender-inegalitarian societies thus

hinges on the ability to distinguish between these two fundamentally different scenarios. Unfortunately, however, previous studies have not produced the empirical evidence required to make this distinction.

We begin fill this important gap in the literature by examining the extent to which changes in both marriage market composition and the general propensity to marry have contributed to later marriage among highly educated women in Japan, one of the most gender-inegalitarian industrialized countries (Brinton 1988, 1989; Tsuya and Mason 1995). After briefly summarizing findings and interpretations from recent research on women's educational attainment and the *desirability* of marriage, we further elaborate the theoretical link between relative improvements in women's achieved socioeconomic status and changes in the *feasibility* of preferred marital pairings. We discuss why the latter scenario is potentially consistent with evidence that the relationship between women's economic resources and marriage is positive or insignificant in countries characterized by a relatively symmetric gender division of labor among spouses but negative in societies characterized by more asymmetric gender relations. To evaluate the two scenarios in the Japanese context, we adapt and extend the methodology employed in an influential study of U.S. marriage behavior (Qian and Preston 1993) to analyze a unique source of data on the marriage behavior of men and women born between 1942 and 1979. This approach allows us to evaluate the extent to which the trend toward later marriage among Japanese women of different educational levels is due to (a) change in the general propensity to marry, (b) change in marriage market composition, and (c) change in the relative likelihood of particular pairings. As described below, (a) can be viewed as a reflection of changes in the desirability of marriage whereas (b) may be viewed as a reflection of changes in the feasibility of

marriage, and (c) may be seen as a potentially important mechanism for moderating the impact of changing marriage market composition.

Women's economic resources, the desirability of marriage, and gender context

Theoretical models of marriage have long emphasized concepts of specialization and exchange to posit a negative relationship between women's economic resources and marriage formation (Becker 1991; Parsons 1949). Because the gains to marriage derive from spouses' pooling of complimentary specializations, marriage is expected to be less advantageous for women with lower comparative advantage in home production (i.e., women whose economic prospects resemble those of potential mates). Commonly referred to as the "economic independence hypothesis," this theoretical perspective provides an intuitively clear explanation for declining rates of marriage that has wide ideological appeal (Oppenheimer 1994).

As noted above, however, the implications of this hypothesis are not consistent with recent empirical evidence from the U.S. Contrary to expectations, it appears that, all else equal, women with higher educational attainment and greater economic resources increasingly marry at *higher* rates than their less economically independent counterparts (e.g., Goldstein and Kenney 2001; Sweeney 2002). This theoretically unexpected finding has been interpreted as evidence of convergence in men's and women's economic roles in the family (Cancian and Sweeney 2004; Mare 1991; Oppenheimer 1988; Qian and Preston 1993). While women continue to perform the majority of domestic work (Shelton and John 1996), it is clear that the terms of marriage have shifted such that American families are no longer characterized by the gender-asymmetric division of labor upon which neoclassical economic and functionalist theories of marriage are predicated (Oppenheimer 1997). Oppenheimer (1994) further argues that, in the context of small nuclear families, economic uncertainty, and relatively high rates of divorce, the risks associated with entering marriages characterized by a highly asymmetric gender division of labor may be

particularly salient for highly educated women. For these reasons, the well-established effect of economic resources in promoting men's marriage is increasingly observed for women as well. Similar reasoning underlies the interpretation of empirical evidence from comparative and international research. The fact that results consistent with the economic independence hypothesis have been found only in relatively gender-inegalitarian societies such as Japan and Italy has been interpreted as evidence that women's economic resources reduce the benefits (either perceived or real) of marriage only when gender-asymmetric spousal relations make it difficult for women to balance work and family (Blossfeld 1995; Ono 2003; Raymo 2003).

Women's economic resources, the feasibility of marriage, and gender context

Although this interpretation of regional variation in the relationship between women's economic resources and marriage is a compelling one, it is not difficult to describe an alternative scenario in which women's education is negatively related to the risk of marriage but unrelated (or perhaps positively related) to the gains to marriage in settings where gender convergence in educational attainment has been rapid. Because marriage is assortative with respect to characteristics such as age, race, education, and family background (Kalmijn 1991; Mare 1991; Oppenheimer 1988), the spouse search process may become increasingly difficult if pairing preferences remain stable while the relative supply of "suitable" mates and/or the likelihood of coming into contact with these potential mates decline (Gray 1987; Jones 1991). Just as a baby boom (bust) will result in a female (male) marriage squeeze if there is a persistent tendency for women to marry men older than themselves (e.g., Akers 1967; Goldman, Westoff, and Hammerslough 1984), rapid convergence in men's and women's socioeconomic status will, all else equal, result in marriage market mismatches for higher status women and lower status men if there is a persistent tendency for men to marry down (hypogamously) and women to marry up

(hypergamously) with respect to characteristics such as education and occupation (Kalmijn 1994; Mare 1991).[2,3]

Gender asymmetry in spouse pairing (i.e., female status hypergamy) is thought to reflect gender asymmetry in work and family roles, with men's role as primary economic provider generating competition in the marriage market for economically "attractive" men (Kalmijn 1994) and for women who are most attractive with respect to home productivity (Becker 1991). It is thus reasonable to expect that gender convergence in spouse pairing preferences is least likely to occur in societies where gender asymmetry in work and family roles remains most pronounced. Marriage market mismatches may therefore be an important part of theoretical explanations for the observed negative relationship between women's economic status and marriage in such societies. Before attributing this relationship to reductions in the gains to marriage brought about by women's increasing economic independence, a careful study of the role played by changes in marriage market composition and spouse pairing patterns is clearly warranted. To this end, we

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[2] Here, we are referring to the tendency for marriages to be female status hypergamous net of marginal distributions. That is, men are more likely to marry down with respect to indicators of socioeconomic status, net of the fact that men have higher levels of socioeconomic status than women, on average.

[3] Although "marriage squeeze" and "marriage market mismatch" refer to the same phenomenon, the term marriage squeeze has typically been used in discussion of changes in the age composition of the marriage market. In this paper, we therefore use the term marriage market mismatch to refer to the effects of changes in the composition of the marriage market with respect to socioeconomic characteristics.

focus on Japan, where declining rates of marriage, rapid convergence in men's and women's educational attainment, and highly asymmetric gender relations within the family make this alternative explanation of the negative relationship between women's education and the risk of marriage particularly plausible.

Marriage and gender relations in Japan

Women's age-specific marriage rates presented in Figure 1 clearly show the trend toward later marriage in Japan. At age 20-29, marriage rates in 2000 were less than half of their 1970 values. Increasing marriage rates among women age 30-39 reflect the increase in mean age at marriage from 24.2 in 1970 to 27.0 in 2000. The very low rates of marriage among teenagers have remained relatively stable over time while those of women in their forties appear to have declined somewhat. Further evidence of changes in women's marriage timing and gender convergence in educational attainment over the past 30 years is provided in Table 1. The upper panel presents trends in the proportion of 25-29 year-old women who have never married. Between 1970 and 2000, the proportion of all 25-29 year-old women yet to marry tripled from .18 to .54. Education-specific figures show that the proportion never married at age 25-29 increased by at least 25 percentage points for all educational groups over this thirty-year period, with the largest increase of 33 percentage points observed among university graduates. The relatively large increase in the total proportion never married (first row) thus reflects both a general trend toward later marriage and changes in the educational composition of the 25-29 year-old female population. Trends in educational attainment have increased the proportion of women in the educational groups most likely to be unmarried. In contrast to the U.S., it appears that these trends reflect both delayed marriage and an increase in the proportion of women who will never marry (Raymo 2003). The most recent population projections for Japan are based on

an assumption that 17% of women born in 1985 and later will never marry (National Institute of Population and Social Security Research 2002).

[Figure 1 about here]

[Table 1 about here]

In the lower panel, trends in education-specific sex ratios for 25-29 year-old men and women clearly demonstrate the rapid relative improvements in women's educational attainment. Over the past thirty years, the ratio of men to women steadily increased at the lower end of the educational spectrum, with men in the lower two categories (i.e., high school education or less) outnumbering similarly educated women by 2000. Over the same period, women's representation in higher education increased dramatically. Male university graduates age 25-29 outnumbered their female counterparts by nearly five to one in 1970 but this ratio is now less than two. The last row shows that, when all types of post-secondary education (i.e., junior colleges, vocational schools, and universities) are considered together, there were two men for every woman with higher education in 1970 but women actually outnumber men by 2000. In other words, for each 25-29 year-old woman with post-secondary education, there is one fewer man of similar age and education in 2000 than there was in 1970. This is a dramatic shift in marriage market composition.

There is considerable evidence that gender relations in Japan are more asymmetric than in many other countries characterized by similar levels of female educational attainment (e.g., Brinton 1993; Tsuya and Mason 1995). Despite the passage of the Equal Opportunity Employment Act in 1986, higher status occupations continue to be highly segregated by gender (Brinton and Ngo 1993) and the wage gap remains wider than in most other industrialized countries (Blau and Kahn 2001; Waldfogel 1998). Furthermore, the division of household labor

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is highly asymmetric, with husbands' contributions far lower in Japan than in most other countries (Kamo 1994; Tsuya and Mason 1995). Indeed, one recent study notes that over 40% of Japanese husbands do no housework at all (Tsuya 2000).

Perhaps most relevant for understanding gender asymmetry in spouse selection preferences in Japan are substantial gender differences in labor force participation across the life course. Unlike their counterparts in many other industrialized societies, a majority of Japanese women exit the labor force following marriage or childbirth. For example, among respondents to the 10th Japanese National Fertility Survey (conducted in 1992), 61% of women married for 5-9 years left the labor force following marriage or the birth of their first child (Institute of Population Problems 1993:16). A similar proportion (60%) of unmarried respondents expressed a desire to do the same (Institute of Population Problems 1994:78), suggesting that this pattern of female labor supply is unlikely to change dramatically in the near future. Because continuous job tenure and work experience are heavily rewarded in the Japanese labor market (e.g., Brinton and Ngo 1993; Clark and Ogawa 1992), achieving economic independence or social status through paid employment is extremely difficult for women who temporarily leave the labor force to raise children (Brinton 2001; Ogawa and Clark 1995). Furthermore, because a four-year college degree is associated with the potential for markedly higher earnings across the life course for women in Japan (Ogawa and Clark 1995; Ogawa and Ermisch 1996; Raymo 2003), the opportunity costs of labor force exit are strongly related to education (Ōsawa and Komamura 1994). Assuming a desire to maintain or improve socioeconomic status via marriage, Japanese women thus have strong incentive to enter status homogamous or status hypergamous marriages. Conversely, the difficulty that women face in combining career and family provides men with little incentive to emphasize women's earnings potential as a spouse selection criterion.

In this context, it is not surprising that gender-asymmetric patterns of spouse selection in Japan are clearly visible in both attitudinal survey data and analyses of spouse pairing behavior. For example, among unmarried respondents to the 11th National Fertility Survey (conducted in 1997), women were twice as likely (50%) as men (24%) to cite educational attainment as an important consideration in choosing a spouse.[4] Gender asymmetry in the importance of "earnings potential" is even more striking, with 91% of women but only 31% of men citing this as an important consideration in choosing a spouse. Furthermore, analyses of spouse pairing have consistently shown educational attainment to be the most important socioeconomic dimension of spouse selection in Japan and have documented a tendency for women (men) to marry hypergamously (hypogamously) net of gender differences in educational attainment (Raymo 2000; Suzuki 1991).

Based on this evidence, several scholars have suggested that gender convergence in educational attainment, in conjunction with the continued strength of gender-asymmetric pairing preferences, has placed numerical constraints on the ability of highly educated Japanese women (and less educated men) to locate suitably educated spouses (e.g., Atoh 1991; Kōno 1991; Retherford, Ogawa, and Matsukura 2001; Yamada 1996). In providing the first rigorous empirical evaluation of this hypothesis, we address two important shortcomings with the marriage market mismatch scenario as it is typically portrayed in Japan. The first is the assumption of inflexible spouse selection preferences. Existing evidence does indeed suggest that patterns of spouse selection have remained relatively stable over time, but it is important to

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[4] These are the proportions of respondents who said that educational attainment was either "important" or "a consideration" in choosing a spouse.

document this empirically. The second shortcoming of the mismatch hypothesis as it is commonly portrayed is its unidimensionality. Education (as a proxy for economic potential) is clearly an important spouse selection criterion, but it is not the only one. Nor is it the most important one. Age is an equally, if not more, important dimension of assortative mating that must be considered in any explanation focusing on changes in the numerical ease or difficulty of locating an acceptable spouse. Although changes in educational attainment clearly influence the number of "attractive" partners for a given individual in the marriage market, past fluctuations in fertility also have clear, and perhaps countervailing, influences. Over the past twenty-five years, the Japanese marriage market has included members of the baby boom cohort (born in 1947-1949), the baby bust cohort (born in 1950-1957), the baby boom echo cohort (born in 1972-1974), and cohorts born during the post-1974 fertility decline (National Institute of Population and Social Security Research 2002). Observed preferences for age-homogamous and female age-hypergamous marriage imply that women in boom cohorts will face a numerically more advantageous marriage market than their counterparts in bust cohorts (Kōno 1991). It is crucial to recognize that these changes in the age composition of the marriage market may offset changes in educational composition to some extent. For example, the decline in the relative supply of highly educated men may be offset to an extent by the fact that declining fertility has also reduced the competition among highly educated women for suitably educated men a few years older than themselves. Discussion of educational mismatches that does not consider fluctuations in the age composition of the marriage market is overly simplistic and potentially misleading.

To examine the roles of marriage market composition and spouse pairing patterns in the trend toward later marriage in Japan, we adopt the approach employed by Qian and Preston

(1993) in their analysis of changing marriage behavior in the U.S. We first replicate this analysis using a unique source of Japanese data on age-education-specific marriage rates from the late-1970s to the mid-1990s. We also follow Qian and Preston (1993) in describing change over time in the components of these marriage rates. An important innovation is our use of these marriage rates to construct educational attainment-specific marriage tables. Simple manipulation of these marriage tables allows us to provide a clear visual representation of the extent to which changes in synthetic cohort marriage trajectories of different educational groups have been influenced by changes in market composition and changes in spouse pairing patterns. Importantly, these marriage trajectories also allow us to assess the extent to which explicit consideration of changes in marriage market composition and patterns of spouse pairing may alter conclusions based on the standard approach to evaluating the economic independence hypothesis.

Data

Our analyses are based on pooled data from the Japanese National Fertility Surveys (JNFS) conducted in 1982, 1987, 1992, and 1997. These surveys provide information on age, educational attainment, and age at marriage for nationally representative samples of married women and unmarried men and women age 18-35 in 1982 and 1987 and age 18-49 in 1992 and 1997. Pooling data from the four surveys results in a total sample of size of 24,860 married women, 13,749 unmarried women, and 16,181 unmarried men born between 1942 and 1979. These individual-level survey data are essential for our analyses because the necessary information is not available from any other source. Vital statistics data provide crosstabulations of spouses' ages for all marriages occurring in a given year, but they do not provide information on brides' and grooms' educational attainment. The most likely source of data for defining the population at risk of marriage by educational attainment, the national census, does not provide age-specific tabulations of marital status and educational attainment for men prior to 1990.

In the absence of appropriate data from the census or administrative records, we use the

large sample of pooled JNFS data to reconstruct the population at risk of first marriage, classified

by educational attainment and five-year age group, for each year between 1957 and 1997. We

accomplish this in three steps. First, we generate observations for married men based on the

responses provided by married women about their husbands' educational attainment, birth date,

and date of marriage. Second, we merge the data for the married and single samples of each sex.

Third, we expand these merged data into person-year record form, creating one observation for

each year that a respondent was between the ages of 15 and 49 during the period 1957-1997.[5]

Using these person-year data, we examine change over time by limiting our focus to two five-

year periods, 1978-82 and 1993-97. Several considerations motivate the choice of these two

time periods. A practical consideration is the need to aggregate data over a period of years in

order to limit the number of empty cells for uncommon pairings. A methodological

consideration is that, by using periods whose midpoints correspond to census years, we can

compare marriage rates constructed from these survey data with marriage rates based on

aggregate data from the vital statistics and the census. A substantive consideration is that the

most dramatic changes in marriage timing occurred during the 1980s. For the sake of simplicity,

we refer to these two periods by their midpoints (i.e., 1980 and 1995) throughout the rest of the

paper.

   Although these pooled JNFS data are the most appropriate for our purposes, they are not

without limitations. Because we are using sample survey data rather than registration data, we

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[5] The oldest respondents (born in 1942) were 15 years old in 1957 and 1997 is the year of the

most recent survey.

must assume that our calculations are not affected by differential nonresponse and differential

mortality with respect to sex, age, and educational attainment to an extent that alters substantive

interpretations. A similar assumption must be made with respect to the absence of information

on first marriages for the six percent of men and women in our sample who were previously

married. The substantive impact of differences in marriage timing and spouse selection with

respect to marital history are thus assumed to be negligible. Our concern about the impact of

these assumptions is mitigated by the similarity of age-specific marriage rates based on our data

with corresponding marriage rates constructed from vital statistics and census data collected in

1980 and 1995.[6]

A second limitation is the fact that we have neither the sample size nor the residential

history information required to construct region-specific rates. We are thus forced to make the

simplifying assumption that spouse search is conducted at the national level. This is obviously

not a realistic portrayal of marriage markets in Japan (or elsewhere) and it is possible that results

would differ if we were able to calculate marriage rates at a lower level of regional aggregation.

Unfortunately, however, there is no available information that would allow us to evaluate the

potential impact of this assumption.

We assess the extent to which changes in marriage market composition and spouse pairing

patterns have contributed to declining marriage rates by analyzing these data in two different

ways. First, we use a slightly modified version of the methods employed by Qian and Preston

(1993) to provide a general picture of changes in marriage rates by age and educational

attainment. By comparing changes in observed marriage rates with changes in counterfactual

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[6] These comparisons are available from the corresponding author upon request.

marriage rates, we are able to assess the relative importance of changes in the desirability and the feasibility of marriage among highly educated women in one setting characterized by gender asymmetric work and family roles. These figures also facilitate comparisons with changing patterns of marriage in the U.S. over a similar time period. Next, we use life-table methods to reexpress observed and counterfactual marriage rates in a way that provides a clear visual representation of the substantive importance of changes in marriage market composition and spouse pairing patterns. By describing educational differences in observed and counterfactual marriage trajectories, we are also able to assess the extent to which explicit consideration of changes in the feasibility of marriage may alter conclusions based on standard techniques for evaluating the economic independence hypothesis.

Changes in Marriage Rates, 1980-1995

Methods

The starting point for our analyses is the harmonic mean function proposed by Schoen (1988) and employed by Qian and Preston (1993) in their analysis of changing marriage behavior in the U.S.

$$N_{ijkl}^t = \alpha_{ijkl}^t \frac{F_{ik}^t M_{jl}^t}{F_{ik}^t + M_{jl}^t}, \tag{1}$$

where N_{ijkl}^t is the number of marriages between women age i with educational attainment k and men age j with educational attainment l in period t (i, j = 15-19, 20-24, 25-29, 30-34, 35-39; 40-49), (k, l = less than high school, high school, junior college/vocational school, university), (t = 1980, 1995). F_{ik}^t is the number of women age i with educational attainment k at risk of marriage in period t and M_{jl}^t is the corresponding number of men age j with educational attainment l. For each of the two five-year periods, the age and education-specific population at risk of first

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marriage is defined as the sum of the unmarried mid-year populations in each of the five years

(i.e., $F_{ik}^t = \sum_{t*=1}^{5} F_{ik}^{t*}$) where F_{ik}^{t*} is the number of unmarried women of age i and educational

attainment k at the middle of year t* (t*=1978, '79, '80, '81, '82, '93, '94, '95, '96, '97). The

remaining component of equation (1), α_{ijkl}^t, is the "force of attraction" between women age i

with education k and men age j with education l in period t. As described by Qian and Preston

(1993: 483), the force of attraction reflects both the rate of encounters in the marriage market and

the proportion of such encounters that lead to marriage.

To calculate marriage rates for women age i with education k to men age j with education l,

we divide both sides of equation (1) by F_{ik}^t. Marriage rates ($MR_{ijkl}^t = \dfrac{N_{ijkl}^t}{F_{ik}^t} = \alpha_{ijkl}^t \dfrac{M_{jl}^t}{F_{ik}^t + M_{jl}^t}$) are

thus expressed as the product of the force of attraction and an "availability ratio" (i.e.,

$\dfrac{M_{jl}^t}{F_{ik}^t + M_{jl}^t}$). With six age groups (i, j) and four educational categories (k, l), we calculate twenty-

four separate marriage rates for women of each age-education combination in each five-year

period (i.e., a total of 24 x 24 = 576 marriage rates for each time period).[7]

An exact replication of Qian and Preston's methods would facilitate explicit U.S.-Japan

comparisons but equation (1) is limiting in that it does not allow us to determine the extent to

which spouse pairing patterns have changed concurrently with changes in marriage market

composition. Because α_{ijkl}^t in equation (1) reflects both a general propensity to marry and the

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[7] Given the age range of the four surveys, there are no observations for women age 40-49 in

1978-1982. We therefore focus on marriage rates through age 35-39.

propensity to marry a person of a particular age and education, observing change over time in

this quantity does not allow us to distinguish change in the overall propensity to marry from

changes in spouse pairing patterns conditional upon marriage. We address this limitation by

reexpressing α_{ijkl}^t as the product of a general propensity to marry and the propensity to marry a

particular type of person. In particular,

$$\alpha_{ijkl}^t = \overline{\alpha}_{ik}^t \frac{\alpha_{ijkl}^t}{\overline{\alpha}_{ik}^t} = \beta_{ik}^t \gamma_{ijkl}^t \qquad (2)$$

where $\overline{\alpha}_{ik}^t = \beta_{ik}^t$ is the mean value of the observed forces of attraction for a woman of given age (i)

and educational attainment (k) in a given five-year time period (t), i.e., $\overline{\alpha}_{ik}^t = \frac{1}{24}\sum_{j,l}\alpha_{ijkl}^t$. We

interpret change over time in this value as change in the general propensity to marry. The second

component, $\frac{\alpha_{ijkl}^t}{\overline{\alpha}_{ik}^t} = \gamma_{ijkl}^t$, is thus the strength of attraction for a given pairing relative to the mean

force of attraction. We interpret change in these relative values as change in patterns of spouse

pairing, conditional upon marriage. Marriage rates may therefore be expressed as the product of

three components:

$$MR_{ijkl}^t = \frac{N_{ijkl}^t}{F_{ik}^t} = \beta_{ik}^t \gamma_{ijkl}^t \frac{M_{jl}^t}{F_{ik}^t + M_{jl}^t}. \qquad (3)$$

This multiplicative expression allows us to examine the relative importance of change in each

component by calculating counterfactual marriage rates for women of a given age and level of

education. For example, by replacing measures of availability from 1995 ($\frac{M_{jl}^{95}}{F_{ik}^{95} + M_{jl}^{95}}$) with those

from 1980 ($\frac{M_{jl}^{80}}{F_{ik}^{80} + M_{jl}^{80}}$) and by summing marriage rates for the twenty-four possible pairings

across values of j and l, we are able to answer the counterfactual question, "what would women's age-education-specific marriage rates be in 1995 if marriage market composition had not changed since 1980?" Similarly, we can replace later measures of β_{ik}^{t} and γ_{ijkl}^{t} with earlier measures to examine what women's age-education-specific marriage rates would be in 1995 if general marriage propensities and spouse pairing patterns, respectively, had not changed since 1980. A counterfactual rate that is higher than the corresponding observed rate for 1995 indicates that change in the component held constant has contributed to lower marriage rates. Conversely, a counterfactual rate that is lower than the corresponding observed rate for 1995 indicates that change in the component held constant has contributed to higher marriage rates.

Results

Figures 2 - 5 present five sets of age-specific marriage rates for women at each level of educational attainment. The broken bold lines represent 1980 marriage rates, the solid bold lines represent 1995 marriage rates, and the thin solid lines represent the three sets of counterfactual marriage rates. To reiterate, these age-education-specific rates represent the sum of marriage rates across all combinations of men's age (j) and educational attainment (l). Comparison of the two sets of observed rates clearly shows the trend toward later marriage. For all educational groups, marriage rates at ages 20-24 and 25-29 declined by at least 30% between 1980 and 1995. Consistent with previous studies (e.g., Raymo 2003), declines in the marriage rates of women in their late twenties have been greatest among the most highly educated. Among university graduates, marriage rates declined by 73% at ages 20-24 and by 51% at ages 25-29. Among high school graduates, the corresponding declines were 47% and 31%, respectively.

[Figures 2 - 5 about here]

In contrast to the U.S., there is little evidence that the marriage rates of highly educated Japanese women have increased at older ages. Among 30-34 year-old university graduates and 35-39 year-old junior-college/vocational school graduates, observed marriage rates are slightly higher in 1995 than in 1980 but there is little evidence of "catch-up" at later ages in response to the sharp declines in marriage rates at earlier ages. The large apparent decline in the marriage rates of 35-39 year-old university graduates should not be given too much emphasis given the very small numbers of marriages upon which these marriage rates were calculated.[8] The actual marriage rate of 35-39 university graduates in 1980 is presumably lower than calculated based on the JNFS data. Importantly, however, this irregularity in the very low rates of marriage among older college graduates has little impact on the calculation of cumulative proportions married in the life-table analyses discussed in the following section.

In contrast to the experience of highly educated women and to the patterns of change in the U.S. described by Qian and Preston (1993), marriage rates have increased at older ages among Japanese women with less education. Beyond age 30, 1995 marriage rates are higher than the corresponding rates in 1980 among women with a high school degree or less. In general, the observed marriage rates in figures 2 - 5 indicate that highly educated Japanese women have experienced relatively large declines in marriage rates at younger ages and relatively small increases in marriage rates at older ages. This pattern of change is ostensibly consistent with the hypothesis that increasing economic opportunities (as proxied by educational attainment) should

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[8] The only women in our sample age 35-39 in 1978-1982 are 45-49 year old respondents to the 1992 survey. This group contains very few college graduates.

be negatively associated with marriage in societies where gender asymmetry in the division of labor makes it difficult for women to combine work and family (e.g., Blossfeld 1995).

However, the counterfactual rates depicted by the thin solid lines in figures 4 and 5 suggest the potential relevance of other explanations for the declining rates of marriage among junior college and university graduates. The lines marked by "◊" indicate that the counterfactual marriage rates calculated by holding general marriage propensities (i.e., β_{ik}^t) constant at their 1980 values are very similar to the observed rates in 1980. This similarity indicates that, not surprisingly, most of the decline in marriage rates is due to decline in the general propensity to marry. At the same time, however, evidence consistent with the hypothesis that changes in marriage market composition may contribute to lower rates of marriage among highly educated women in societies characterized by gender-asymmetric work and family roles is visible from the rates described by the lines marked by "x." These rates, calculated by holding availability ratios (i.e., $\dfrac{M_{jl}^t}{F_{ik}^t + M_{jl}^t}$) constant at their 1980 values, show that changes in marriage market composition (independent of changes in marriage propensities) have contributed to lower marriage rates for women with postsecondary education. This is particularly true for marriage rates at age 25-29, when the observed rate for 1995 is 20% lower than the counterfactual rate for junior college graduates and 13% lower for university graduates. It thus appears that changes in the supply of "attractive" mates have contributed to reductions in the marriage rates of 25-29 year-old women with at least two years of post-secondary education. The lines marked by "*" indicate that changes in spouse pairing patterns have, to some extent, compensated for changes in marriage market composition among junior college graduates. In figure 4, the counterfactual rates calculated by holding γ_{ijkl}^t constant at their 1980 levels are lower than the observed 1995

rates at ages 25-29 and beyond, indicating that the relative pairing propensities of junior college graduates have responded to changes in the age and educational composition of potential mates. The same pattern is not observed, however, among university graduates. In figure 5, the similarity of observed 1995 rates and the counterfactual rates calculated by holding relative pairing propensities constant indicates that the spouse pairing patterns of the most highly educated Japanese women have not adjusted to decline in the relative availability of similarly educated men. In fact, increase in the general propensity to marry at ages 30-34 has been offset to some extent by marriage-inhibiting changes in spouse pairing patterns. Among 30-34 year-old university graduates, the observed marriage rate for 1995 is 34% higher than the counterfactual marriage rate calculated holding general marriage propensities constant at 1980 levels but 8% lower than the counterfactual rate calculated holding relative pairing propensities constant at 1980 levels. The large increase in the general propensity to marry is not consistent with a scenario in which reductions in the gains to marriage lead highly educated women to avoid marriage.

A very different pattern of change is described by the counterfactual rates for women with lower levels of educational attainment. Among both junior high school graduates (figure 2) and high school graduates (figure 3), the counterfactual rates calculated by holding general marriage propensities constant at their 1980 values (i.e., line marked by "◊") are substantially higher than the observed rates for 1980 at all but the youngest ages. At age 25-29, for example, the marriage rate of high school graduates in 1995 would have been 38% higher than the marriage rate observed in 1980 if the general propensity to marry had not changed. Among women with lower levels of education, it is clear that large declines in the general propensity to marry have been offset to some degree by changes in marriage market composition and spouse pairing patterns.

The observed increase in marriage rates at older ages for these women thus reflects the fact that marriage-promoting changes in the age and educational composition of potential mates, along with changes in spouse pairing patterns, have more than offset declines in the general propensity to marry. At all ages, the observed marriage rates of junior high school graduates in 1995 are higher than the counterfactual rates calculated by holding marriage market composition constant at 1980 values. Among high school graduates, marriage market composition appears to have changed very little, with the exception of marriage-facilitating changes at ages 30-34. It is thus clear that the large observed declines in the marriage rates of less educated women in their twenties are primarily due to changes in the general propensity to marry. Changes in relative pairing patterns appear to have promoted marriage among high school graduates but have had little effect on the marriage rates of women with less than a high school education. A closer look at change in relative forces of attraction for individual pairings (not presented) suggests that it is primarily an increase in the propensity for educational homogamy that has contributed to higher rates of marriage among high school graduates.

Taken as a whole, the figures for women with lower levels of education indicate that marriage-promoting changes in marriage market composition and pairing patterns have, to some extent, offset declines in the general propensity to marry. Indeed, the decline in general propensity to marry at older ages has been more than offset by changes in the other two components. In contrast, the declining marriage rates of highly educated women appear to be partially attributable to changes in marriage market composition and spouse pairing patterns. Overall, this pattern of results suggests the relevance of a scenario in which *relatively* larger declines in the marriage rates of highly educated women are the result of marriage market mismatches rather than reductions in the gains to marriage. The contrasting patterns of change at

higher and lower levels of education suggest that the standard approach of contrasting decline in the marriage rates of highly educated women with that of women in a less-educated reference group may produce misleading inferences about the relevance of increasing economic independence as an explanation for later and less marriage.

Observed and counterfactual marriage trajectories for synthetic cohorts

Comparison of observed and counterfactual marriage rates indicates that changes in marriage market composition and relatively stable spouse pairing patterns have contributed to lower rates of marriage among highly educated women. It is difficult, however, to assess the substantive importance of marriage market mismatches simply by comparing these age-specific rates. To describe the substantive impact of changes in market composition and spouse pairing patterns, we therefore use the marriage rates described in figures 2 - 5 to construct synthetic cohort marriage trajectories for women at each level of educational attainment. We first use standard procedures to convert the rates into probabilities (see e.g., Preston, Heuveline, and Guillot 2001:76) necessary for the construction of multiple-group, multiple-decrement marriage tables. We then construct a total of sixteen marriage tables – eight tables based on observed rates (i.e., 4 levels of education x 2 time periods) and eight tables based on the counterfactual rates calculated by holding marriage market composition and spouse pairing patterns constant at their 1980 levels. In each of these marriage tables there are twenty-four possible decrements representing spouses' age and educational attainment (i.e., 4 levels of education x 6 age groups).[9]

Straightforward calculation of cumulative survival probabilities based on both observed and counterfactual marriage rates produces visibly intuitive descriptions of the extent to which large

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[9] We ignore mortality in all marriage table calculations.

increases in the age-specific proportions of Japanese women who have never married reflect

changes in marriage market composition - as suggested by our theoretical emphasis on changes

in the feasibility of marriage. At the same time, they describe the extent to which changes in

spouse pairing patterns have moderated the effects of changing marriage market composition.

Comparison of marriage trajectories across levels of educational attainment also allows us to

assess the extent to which standard methods for evaluating the economic independence

hypothesis may generate misleading conclusions by ignoring the impact of changes in the

feasibility of marriage.

Education-specific cumulative first marriage curves based on these marriage table

calculations are presented in figures 6 - 9. In each of these four figures, we present two

trajectories based on observed marriage probabilities and two trajectories based on

counterfactual probabilities. Because we have calculated marriage probabilities for five-year age

groups, the points on these marriage trajectories represent the proportion never married at the

beginning of the five-year age group (i.e., at exact age 15, 20, …., 40). As in figures 2 - 5, we

use bold lines to depict cumulative first marriage curves based on observed marriage

probabilities from 1980 (broken lines) and 1995 (solid lines). These two synthetic cohort

marriage curves based on observed data clearly demonstrate the large increase in age at

marriage. At each level of educational attainment, the synthetic cohort proportions ever married

beyond age 25 declined substantially between 1980 and 1995. Although the percentage point

decline in the proportion ever married is similar across educational groups at younger ages, the

largest declines beyond age 30 have been experienced by junior college/vocational school and

university graduates. The largest observed change is the 32 point decline in the synthetic cohort

proportion of university graduates married by age 30. Consistent with the evidence presented in

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figures 2 - 5, large declines in life table proportions ever married by age 40 suggest increases across the educational spectrum in the proportion of women who will never marry. Whereas the proportion never married at age 40 in 1980 ranged from 6% among university graduates to 12% among junior high school graduates, roughly 20% of women with a junior college education or less and over 25% of women a university degree have yet to marry by age 40 in 1995.

[Figures 6 - 9 about here]

The thin solid lines marked with "x" represent counterfactual cumulative first marriage curves calculated by holding availability ratios (i.e., $\dfrac{M_{jl}^{t}}{F_{ik}^{t} + M_{jl}^{t}}$) constant at their 1980 values. These curves thus indicate what the synthetic cohort marriage trajectories would have looked like in 1995 if marriage market composition had not changed. The thin solid lines marked with "*" represent the counterfactual marriage patterns calculated by holding spouse pairing patterns (i.e., γ_{ijkl}^{t}) constant at their 1980 values. These curves thus indicate what the synthetic cohort marriage trajectories would have looked like in 1995 if relative propensities for different pairings by age and educational attainment had not changed.

For women with a high school education (figure 7) or less (figure 6), the marriage-promoting effect of changing marriage market composition described above is quite clear. The counterfactual marriage curves calculated by holding availability ratios constant at their 1980 values fall below the observed 1995 curve beyond age 25, indicating that proportions ever married would have been even lower than observed had marriage market composition not changed over time. This is particularly true for women in the lowest educational category. An examination of individual availability ratios (not shown) suggests that this is largely a reflection of the increasing prevalence of older (i.e., age 30 and above) unmarried men, especially at the

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lower end of the educational spectrum (high school graduation or less). It also appears that changes in spouse pairing patterns have contributed to marriage among high school graduates but not among women in the lowest educational category. The cumulative proportion ever married beyond age 25 would have been roughly six percentage points lower among high school graduates had spouse pairing patterns (i.e., relative forces of attraction) remained at their 1980 values.

A fundamentally different pattern of change is observed among women with higher levels of education. Figures 8 and 9 indicate that changes in marriage market composition have had a negative effect on the transition to marriage among junior college/vocational school graduates and university graduates, respectively. For both groups, changes in the availability of potential partners are responsible for a non-trivial proportion of the overall decline in the synthetic cohort proportion ever married. This particularly true for junior college/vocational school graduates beyond age 30, for whom the counterfactual curve calculated by holding availability ratios constant at their 1980 levels is 4 to 8 percentage points above the observed curve for 1995. In other words, if marriage market composition had not changed over the fifteen-year period, the decline in the synthetic cohort proportion of two-year college graduates yet to marry would have been 4 to 8 percentage points less than was actually observed. For college graduates, the difference is 2 to 5 percentage points beyond age 30. These figures represent roughly 33% of the total decline in the synthetic cohort proportion of two-year college graduates unmarried beyond age 30 and 15% of the observed decline for university graduates.[10]

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[10] We calculated the percentage contribution of changing marriage market composition as

$[(P_{ik}^{95(AR=80)} - P_{ik}^{95})] \div (P_{ik}^{80} - P_{ik}^{95})$, where P_{ik}^{t} is the proportion of women with education k never

These are substantively important contributions that provide some support for the hypothesis motivating this study. At the same time, however, it is clear that the bulk of the decline in marriage is attributable to change in the general propensity to marry. Furthermore, changes in the pairing patterns of junior college/vocational school graduates have largely offset the marriage-inhibiting effects of changes in marriage market composition beyond age 30. Counterfactual marriage trajectories calculated by holding both spouse pairing patterns and availability ratios constant at their 1980 values (not shown) indicate that the synthetic proportion of two-year college graduates ever married would have been only 0 to 3 percentage points lower than observed in 1995.

It is important to recognize that, although the changes in the feasibility of marriage account for a relatively small proportion of the decline in marriage among highly educated women, changes in marriage market composition and spouse pairing patterns have had a very noticeable marriage-promoting effect among less educated women. As a result of these asymmetric influences, conclusions regarding the relevance of the economic independence hypothesis depend upon treatment of the changes in the feasibility of marriage. In Figure 10, we present the ratio of the synthetic cohort proportions of highly educated women ever married by a given age to the corresponding proportions for high school graduates. Age-specific figures for 1980 (gray bars) and 1995 (black bars) indicate that the relative likelihood of marriage for two-year college graduates (left) and university graduates (right) has declined at all ages. For example, at age 30-34, the ratio of the synthetic cohort proportion of university graduates ever married to that of

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married by age i in period t and $P_{ik}^{95(AR=80)}$ is the counterfactual proportion calculated by holding availability ratios constant at their 1980 levels.

high school graduates was .97 in 1980 and .72 in 1995. This increasing educational differential in marriage is typically interpreted as evidence of an independence effect, i.e., highly educated women have become less dependent upon men's economic resources and thus marry at lower rates. A very different picture emerges, however, when we hold both marriage market composition and pairing preferences constant at their 1980 values (hatched bars). The fact that these counterfactual ratios are higher than the observed ratios for 1980 at older ages indicates that the decline in the marriage rates of highly educated women would have been *less* than that of high school graduates if there had been no changes in the feasibility of marriage. Furthermore, it is clear that highly educated women are actually more likely to be married than their less educated counterparts under this counterfactual scenario. Beyond age 30 for junior college graduates and beyond age 35 for university graduates, the ratios of the counterfactual synthetic cohort proportions married are actually greater than one. This counterfactual pattern of change is very similar to the observed pattern of change in the U.S. (Qian and Preston 1993) and suggests that the apparent support for the economic independence hypothesis in Japan (Ono 2003; Raymo 2003) actually reflects changes in the feasibility of marriage. These results also suggest that the standard methodological approach to evaluating the economic independence hypothesis may result in inappropriate conclusions regarding the social processes underlying the decline in marriage rates.

[Figure 10 about here]

Summary and Discussion

We have shown that changes in marriage market composition account for between 15% and 33% of the decline in the synthetic cohort proportion of highly educated Japanese women who have married. This substantial contribution is consistent with the hypothesis motivating this study. It is important to note, however, that the bulk of change in marriage timing at all levels of

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education is due to change in the general propensity to marry. Large declines in the general propensity to marry presumably reflect a variety of mechanisms including reductions in the gains to marriage and changing attitudes toward marriage and family formation. At the same time, our results highlight a fundamental problem with the conventional approach of interpreting relatively large decline in the marriage rates of highly educated women in relatively gender-inegalitarian societies as support for the economic independence hypothesis. Economic independence may indeed be an important part of the story but it does not appear to be the main reason for relatively larger declines in marriage rates among Japanese women with post-secondary education. Indeed, we find that the "excess" decline in marriage observed among highly educated women (typically interpreted as evidence of increasing economic independence) may be explained by changes in marriage market composition and relatively stable spouse pairing patterns. Changes in the supply of potential partners brought about by relative improvements in women's educational attainment have contributed to somewhat lower rates of marriage among highly educated women and somewhat higher rates of marriage among women with a high school education or less. Accounting for these changes in marriage market composition and changes in patterns of spouse selection, decline in the general propensity to marry among women with at least a two-year college degree has actually been lower than among high school graduates.

These results should not be interpreted as unequivocal evidence that economic independence is unimportant for understanding the trend toward later marriage in societies where asymmetric gender relations make it difficult for women to combine work and family. They do, however, suggest that women's increasing educational attainment may contribute to later marriage even in the absence of an independence effect. At the very least, it is clear that the documented negative relationship between women's educational attainment and marriage in Japan is more complex

than previous research has suggested. Our results also suggest that mechanisms of change may vary by age, with economic independence more relevant at younger ages (20-24) and marriage market mismatches more relevant at older ages (25-34). It is also possible that marriages characterized by a highly asymmetric gender division of labor may indeed be increasingly unattractive to highly educated women with higher levels of career investment or career ambitions while other similarly educated women with less commitment to work and gender-egalitarian division of labor between spouses may be marrying later (and less) as a result of the increasing numerical difficulty of locating a suitably educated spouse. Such a scenario would be consistent with previous claims of heterogeneity among highly educated women in Japan (Tsuya and Mason 1995) and with evidence that the desire for a gender-symmetric division of labor within the family is by no means universal in Japan (Institute of Population Problems 1994).

Our results contrast with those of Qian and Preston (1993) and other studies of changing marriage patterns in the U.S. We find no evidence that increases in marriage rates at older ages have been relatively larger among highly educated women in Japan and only limited evidence that marriage is being facilitated by diminishing gender differences in spouse-selection criteria (Oppenheimer 1997; Qian and Preston 1993). In the U.S., it has been suggested that relative improvements in women's economic opportunities may facilitate marriage by enabling couples to pool resources at young ages or by enabling women to marry men who do not yet have the financial resources to marry but are otherwise attractive (Oppenheimer 1988). This marriage-facilitating effect of women's economic resources may be less relevant in societies such as Japan where the desire for status homogamous or status hypergamous marriages among highly educated women is reinforced by a highly asymmetric gender-division of work and family roles.

At the same time, however, it is important to note that we do find some evidence of such adjustment in spouse pairing patterns among junior college/vocational school graduates.

This study represents an important extension of previous empirical analyses of the relationship between women's increasing educational attainment and declining rates of marriage, but there are several important limitations that should be addressed in subsequent research. The most obvious limitation is the nature of the data we use. In the absence of registration data, we have relied upon retrospective data pooled across multiple cross-sectional surveys. Such data not only preclude examination of change in marriages that were rare in one or both time periods (e.g., marriages involving 35-39 year-old university graduates), but they also cannot be used to examine more than two dimensions of spouse pairing. The number of observations is not sufficient to examine pairing with respect to a wider range of characteristics. It is not likely that subsequent research will be able to address these limitations by using registration data from Japan. It is both feasible and important, however, that our findings from Japan be evaluated in other settings where a negative relationship between women's educational attainment and marriage has been observed. Finding that changes in marriage market composition, in conjunction with stable spouse pairing patterns, have played an important role in declining rates of marriage among highly educated women in countries such as Italy, Spain, Korea, and Taiwan would provide further reason to question the conventional interpretation that economic independence contributes to reductions in marriage only in societies where asymmetric gender-relations within the family make it difficult for women to combine work and family. At the same time, such findings would suggest the general relevance of a scenario in which highly educated women in societies characterized by structural and normative difficulties in combining work and family face increasing numerical difficulty in locating a spouse upon whom they can be

economically dependent. Because the mechanism of change in this scenario contrasts fundamentally with the notion that women's increasing economic independence reduces the gains to marriage, there is clear sociological relevance in developing a better understanding of how the relationship between women's economic resources and marriage may depend upon gender context.

References

Akers, Donald S. 1967. "On Measuring the Marriage Squeeze." *Demography* 4:907-924.

Atoh, Makoto. 1991. "The Background of Fertility Decline and the Outlook for the Future."

Journal of Japanese Labor Research no. 381:2-11. (in Japanese)

Becker, Gary S. 1991. *A Treatise on the Family*. Cambridge, MA: Harvard University Press.

Blau, Francine D. & Lawrence M. Kahn. 2001. "Understanding International Differences in the

Gender Pay Gap," NBER Working Papers 8200, National Bureau of Economic Research,

Inc.

Blossfeld, Hans-Peter. 1995. "Changes in the Process of Family Formation and Women's

Growing Economic Independence: A Comparison of Nine Countries." Pp. 3-32 in *The New*

Role of Women: Family Formation in Modern Societies, edited by H.-P. Blossfeld. Boulder,

CO: Westview Press.

Blossfeld, Hans-Peter & Johannes Huinink. 1991. "Human Capital Investments or Norms of

Role Transition? How Women's Schooling Affects the Process of Family Formation."

American Journal of Sociology 97:143-168.

Bracher, Michael & Gigi Santow. 1998. "Economic Independence and Union Formation in

Sweden." *Population Studies* 52:275-294.

Brinton, Mary C. 1988. "The Social-Institutional Bases of Gender Stratification: Japan as an

Illustrative Case." *American Journal of Sociology* 94(2): 300-334.

Brinton, Mary C. 1989. "Gender Stratification in Contemporary Urban Japan." *American*

Sociological Review 54: 549-64.

Brinton, Mary C. 1993. *Women and the Economic Miracle: Gender and Work in Postwar Japan*.

Berkeley, CA: University of California Press.

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Brinton, Mary C. 2001. "Married Women's Labor in East Asian Economies." Pp.1-37 in *Women's Working Lives in East Asia*, edited by M.C. Brinton. Stanford, CA: Stanford University Press.

Brinton, Mary C. & Hang-Yue Ngo. 1993. "Age and Sex in the Occupational Structure: A United States-Japan Comparison." *Sociological Forum* 8:93-111.

Clark, Robert L. & Naohiro Ogawa. 1992. "Employment Tenure and Earnings Profiles in Japan and the United States: Comment." *American Economic Review* 82:336-345.

Goldman, Noreen, Charles F. Westoff, & Charles Hammerslough. 1984. "Demography of the Marriage Market in the United States." *Population Index* 50:5-25.

Goldstein, Joshua A. & Catherine T. Kenney. 2001. "Marriage Delayed or Marriage Foregone? New Cohort Forecasts of First Marriage for U.S. Women." *American Sociological Review* 66:506-519.

Gray, Alan. 1987. "Intermarriage: Opportunity and Preference." *Population Studies* 41:365-379.

Institute of Population Problems. 1993. *The Tenth National Fertility Survey in 1992, vol.1: Marriage and Fertility in Present-Day Japan*. Tokyo: Ministry of Health and Welfare, Institute of Population Problems. (in Japanese)

Institute of Population Problems. 1994. *The Tenth National Fertility Survey, vol.II: Attitudes toward Marriage and the Family among the Unmarried Japanese Youth*. Tokyo: Ministry of Health and Welfare, Institute of Population Problems.

Iwasawa, Miho and James M. Raymo. 2004 (forthcoming). "Invisible Nonmarital Fertility: Increase in Marriages Preceded by Pregnancy in Japan." In *Research on Fertility Decline and Family and Labor Policies: Annual Report of Health and Labor Science Research Grants 2003*. Tokyo: National Institute of Population and Social Security Research. (in Japanese).

Jones, Frank L. 1991. "Ethnic Intermarriage in Australia, 1950-52 to 1980-82: Models or Indices?" *Population Studies* 45:27-42.

Kalmijn, Matthiijs. 1991. "Status Homogamy in the United States." *American Journal of Sociology* 97:496-523.

Kalmijn, Matthiijs. 1994. "Assortative Mating by Cultural and Economic Occupational Status." *American Journal of Sociology* 100:422-452.

Kamo, Yoshinori. 1994. "Division of Household Work in the United States and Japan." *Journal of Family Issues* 15:348-378.

Kōno, Shigemi. 1991. "A Treatise on Sex Ratio in Population by Marital Status: Marriage Squeeze and Widowhood" *Journal of Population Problems* 47(1):1-16. (in Japanese)

Mare, Robert D. 1991. "Five Decades of Assortative Mating." *American Sociological Review* 56:15-32.

National Institute of Population and Social Security Research. 2002. *Population Projections for Japan: 2001-2050*. Tokyo: National Institute of Population and Social Security Research. (in Japanese).

Ogawa, Naohiro & Robert L. Clark. 1995. "Earnings Patterns of Japanese Women: 1976-1988." *Economic Development and Cultural Change* 43:293-313.

Ogawa, Naohiro & John F. Ermisch. 1996. "Family Structure, Home Time Demands, and the Employment Patterns of Japanese Married Women." *Journal of Labor Economics* 14:677-702.

Ono, Hiromi. 2003. "Women's Economic Standing, Marriage Timing, and Cross-National Contexts of Gender." *Journal of Marriage and Family* 65:275-286.

Oppenheimer, Valerie K. 1988. "A Theory of Marriage Timing." *American Journal of Sociology* 94:563-591.

Oppenheimer, Valerie K. 1994. "Women's Rising Employment and the Future of the Family in Industrial Societies." *Population and Development Review* 20:293-342.

Oppenheimer, Valerie K. 1997. "Women's Employment and the Gains to Marriage: The Specialization and Trading Model of Marriage." *Annual Review of Sociology* 23:431-453.

Oppenheimer, Valerie K. & Vivian Lew. 1995. "American Marriage Formation in the 1980s: How Important was Women's Economic Independence?" Pp. 105-138 in *Gender and Family Change in Industrialized Countries*, edited by K.O. Mason and A.-M. Jensen. Oxford, U.K.: Clarendon Press.

Ōsawa, Machiko & Komamura, Yasuhira. 1994. "The Economics of Marriage: Factors behind the trend toward later marriage." Pp. 37-53 in Shakai Hoshō Kenkyūjo (Ed.), *Contemporary Social Security: Marriage, Childbirth, and Childrearing* Tokyo: Tokyo Daigaku Shuppankai. (in Japanese)

Parsons, Talcott. 1949. "The Social Structure of the Family." Pp.173-201 in *The Family: Its Function and Destiny*, edited by R.N. Anshen. New York: Harper and Brothers.

Pinelli, Antonella & Alessandra De Rose. 1995. "Italy." Pp.174-190 in *The New Role of Women: Family Formation in Modern Societies*, edited by H.-P. Blossfeld. Boulder, CO: Westview Press.

Preston, Samuel H., Patrick Heuveline, & Michel Guillot. 2001. *Demography: Measuring and Modeling Population Processes*. Oxford, U.K.: Blackwell Publishers.

Qian, Zhenchao & Samuel Preston. 1993. "Changes in American Marriage: 1972-1987." *American Sociological Review* 58:482-495.

Raymo, James M. 2000. "Spouse Selection and Marriage Timing in Japan." Unpublished
dissertation, Department of Sociology, University of Michigan, Ann Arbor, MI.

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

Retherford, Robert D., Naohiro Ogawa, & Rikiya Matsukura. 2001. "Late Marriage and Less
Marriage in Japan." *Population and Development Review* 27:65-102.

Santow, Gigi & Michael Bracher. 1994. "Change and Continuity in the Formation of First
Marital Unions in Australia." *Population Studies* 48:475-496.

Schoen, Robert. 1988. *Modeling Multigroup Populations*. New York: Plenum Press.

Shelton, Beth A. & Daphne John. 1996. "The Division of Household Labor." *Annual Review of
Sociology* 22:299-322.

Suzuki, Tohru. 1991. "Social Intermarriages in Japan." *Journal of Population Problems*
46(4):14-31. (in Japanese)

Sweeney, Megan M. 2002. "Two Decades of Family Change: The Shifting Economic
Foundations of Marriage." *American Sociological Review* 67:132-147.

Sweeney, Megan & Maria M. Cancian. 2004. "The Changing Importance of White Women's
Economic Prospects for Assortative Mating." Forthcoming in *Journal of Marriage and
Family*.

Thornton, Arland D., William G. Axinn, & Jay D. Teachman. 1995. "The Influence of School
Enrollment and Accumulation on Cohabitation and Marriage in Early Adulthood." *American
Sociological Review* 60:762-774.

Tsuya, Noriko O. (2000). Gender Differences in Employment and Housework: A Comparative Analysis of Japan, South Korea, and the United States. *Journal of Population Problems*, 56(2):25-48. (in Japanese)

Tsuya, Noriko O. & Karen O. Mason. 1995. "Changing Gender Roles and Below Replacement Fertility in Japan." Pp.139-167 in *Gender and Family Change in Industrialized Countries*, edited by K.O. Mason and A.-M. Jensen. Oxford, U.K.: Clarendon Press.

Waldfogel, Jane. 1998. " Understanding the "Family Gap" in Pay for Women With Children." *The Journal of Economic Perspectives* 12:137-56.

Xie, Yu, James M. Raymo, Kimberly Goyette, & Arland Thornton. 2003. "Economic Potential and Entry into Marriage and Cohabitation." *Demography* 40:351-367.

Yamada, Masahiro. 1996. *The Sociology of Marriage*. Tokyo: Maruzen. (in Japanese)

Table 1: Proportions Never Married and Education-Specifc Sex Ratios, Age 25-29, 1970-2000

Census Year	1970	1980	1990	2000	Difference 2000-1970
Proportion Never Married					
Total*	0.18	0.24	0.40	0.54	0.36
Junior High School	0.15	0.17	0.31	0.42	0.27
High School	0.20	0.21	0.33	0.45	0.25
Junior College/Vocational School	0.29	0.32	0.46	0.57	0.27
University	0.36	0.41	0.56	0.69	0.33
Education-Specifc Sex Ratios					
Total*	99	101	102	103	4
Junior High School	91	114	165	145	54
High School	84	84	92	109	25
Junior College/Vocational School	42	29	32	41	-1
University	486	330	281	186	-300
All Postsecondary education	198	127	103	88	-110

* Total includes those still in school (1.3% of total 25-29 year old female population in 2000).

Source: Population Census of Japan (Statistics Bureau - Management and Coordination Agency, various years).

Figure 1: Change in Age-Specific Marriage Rates of Japanese Women, 1970-2000
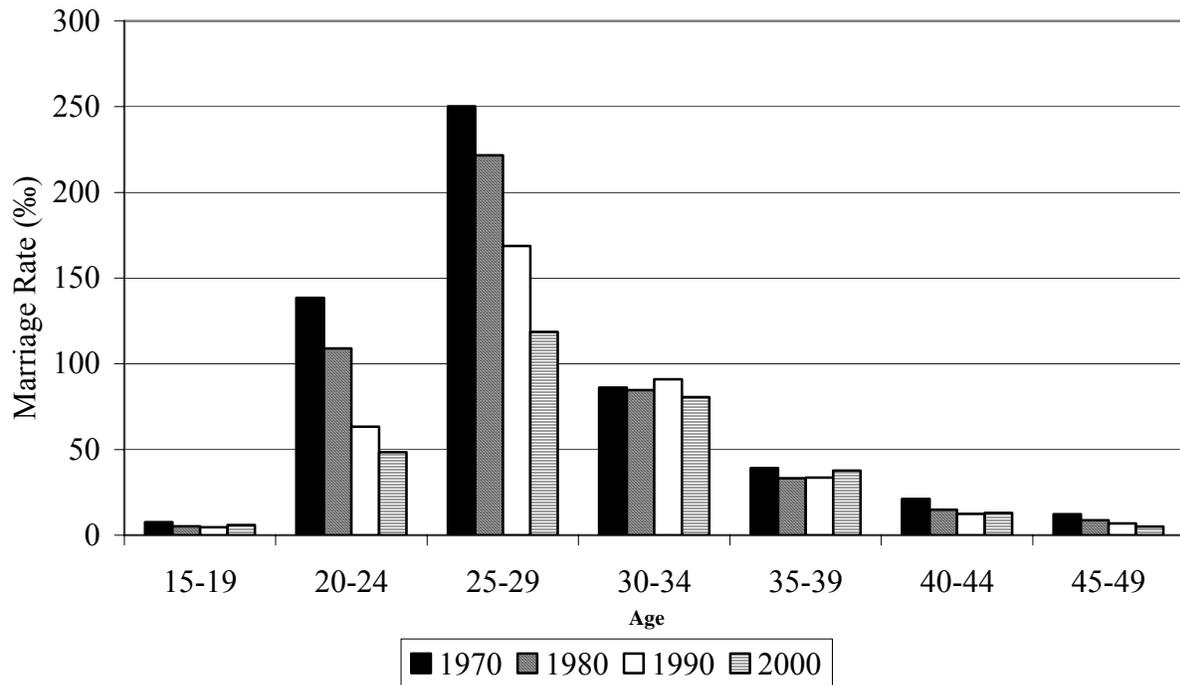
Source: National Institute of Population and Social Security Research. 2003. *Population Statistics of Japan*. Tokyo: author.

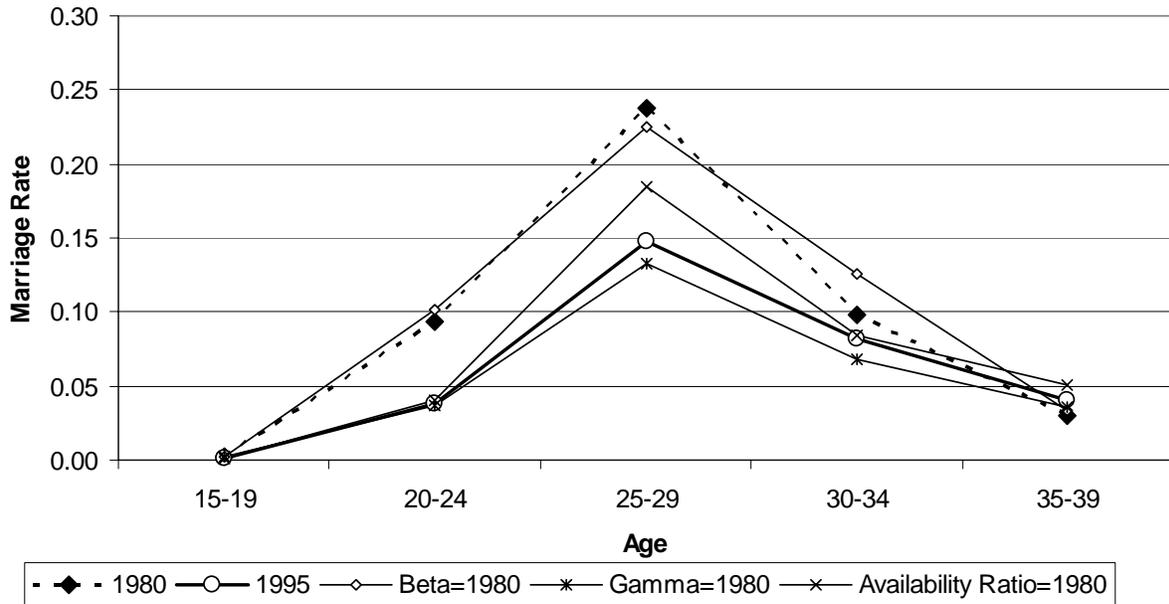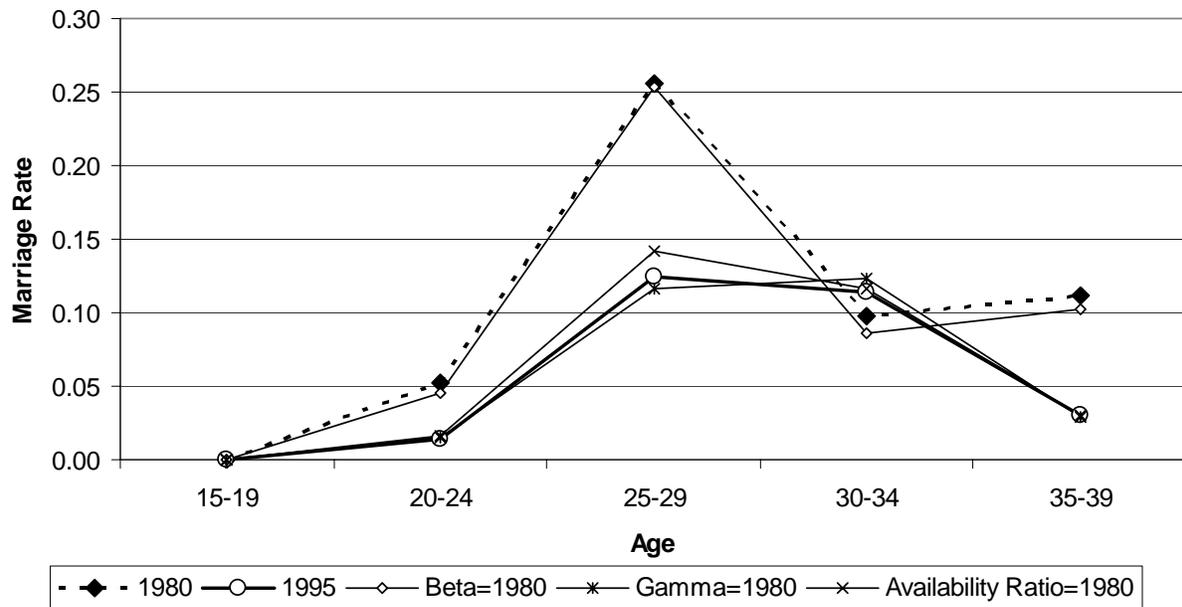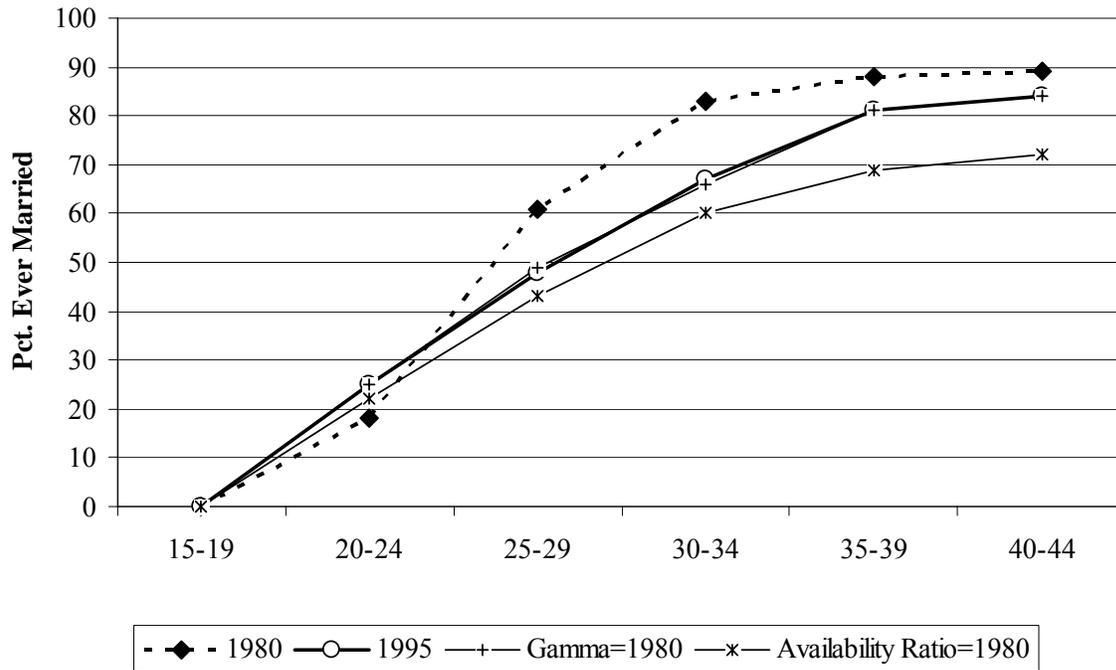Figure 2: Observed and Counterfactual Marriage Rates for Junior High School Graduates
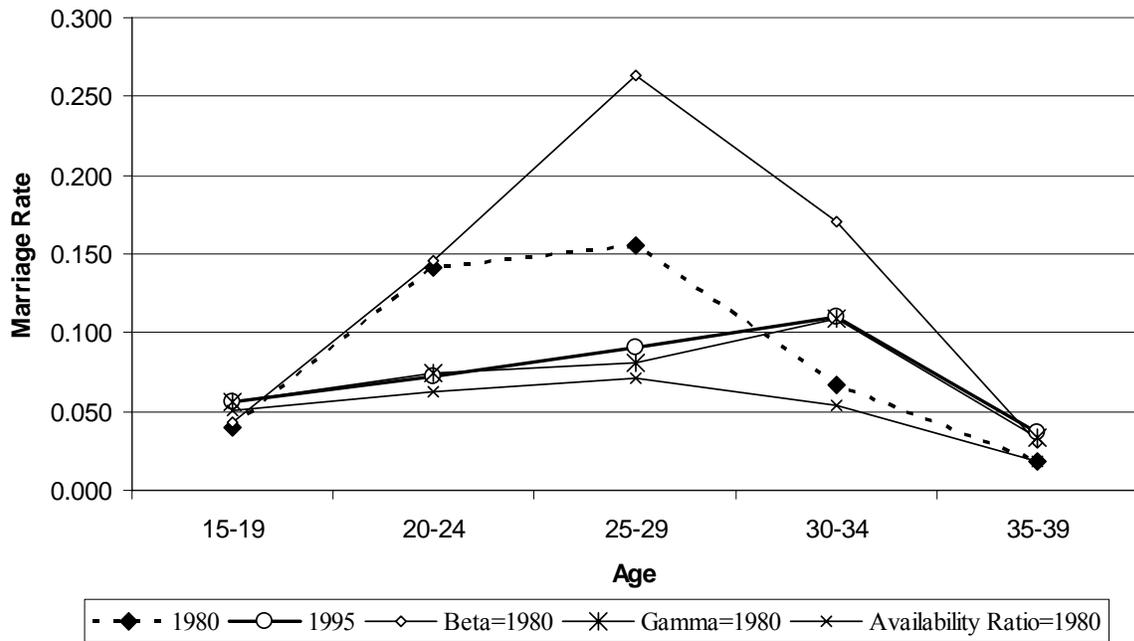
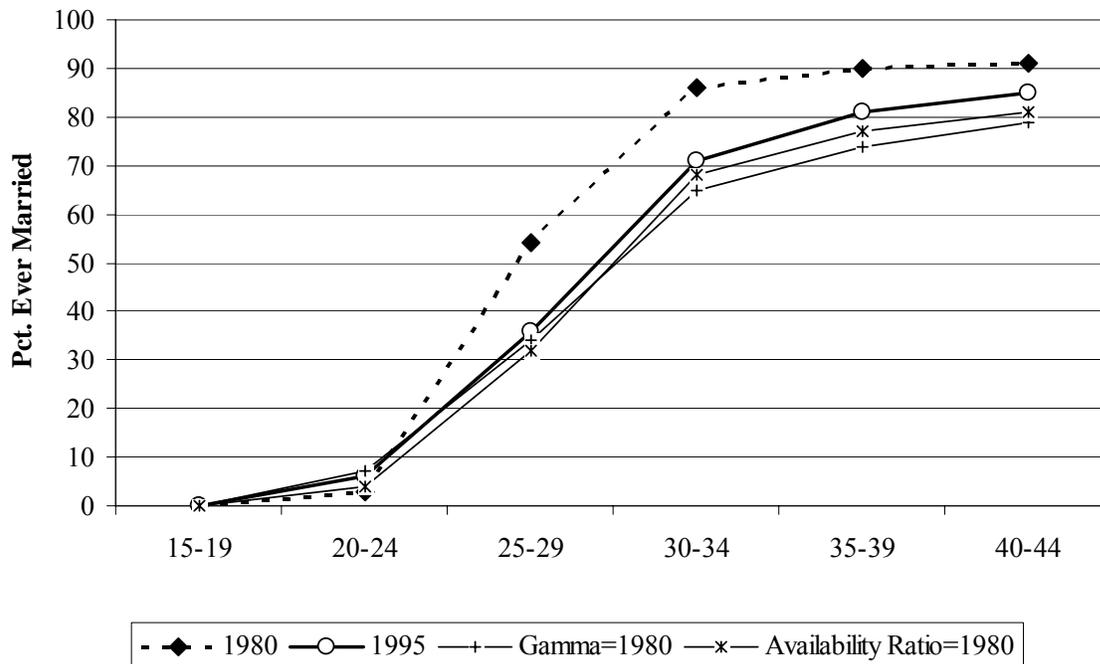Figure 3: Observed and Counterfactual Marriage Rates for High School Graduates
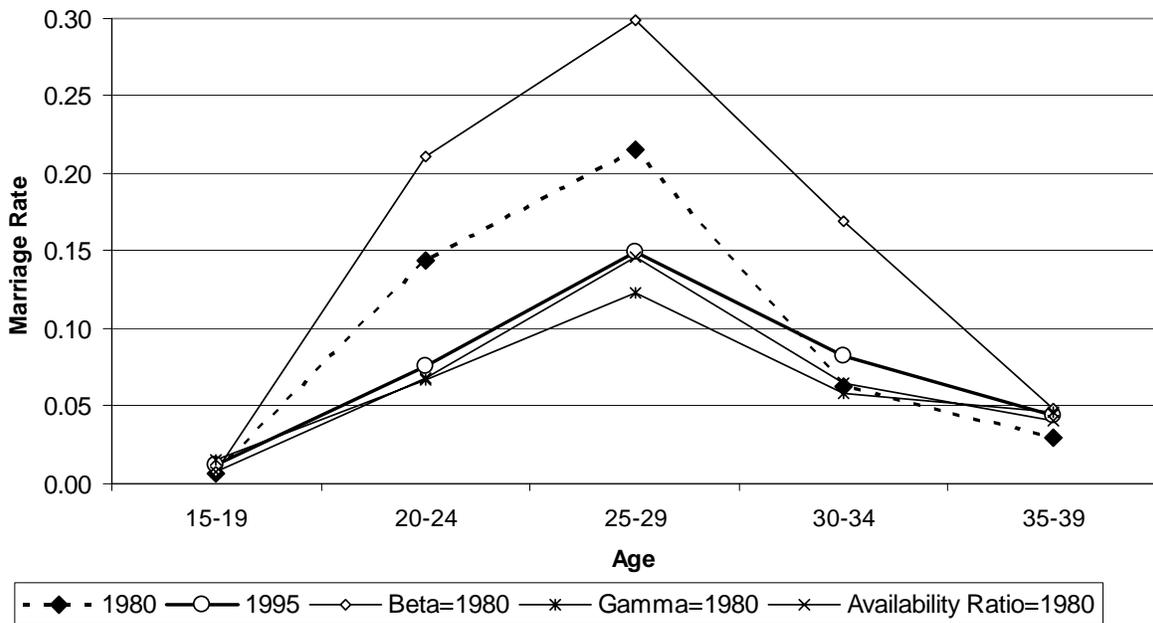
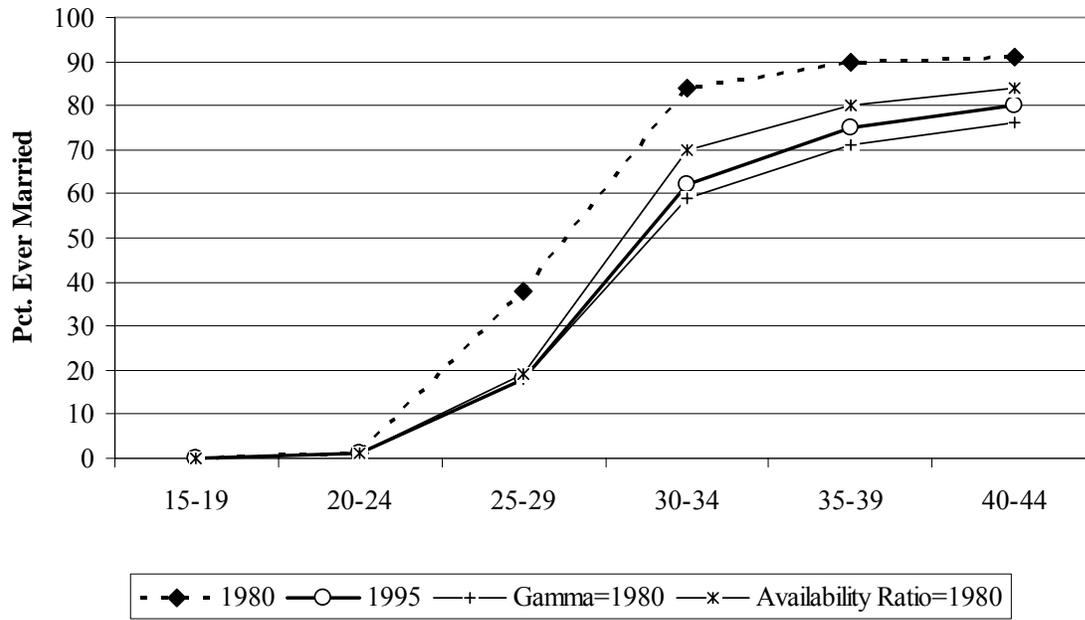Figure 4: Observed and Counterfactual Marriage Rates for Junior College/Vocational School Graduates

Legend: - ◆ - 1980 —○— 1995 —◇— Beta=1980 —✳— Gamma=1980 —✕— Availability Ratio=1980

Figure 5: Observed and Counterfactual Marriage Rates for University Graduates

Legend: - ◆ - 1980 —○— 1995 —◇— Beta=1980 —✳— Gamma=1980 —✕— Availability Ratio=1980

Figure 6: Observed and Counterfactual Marriage Trajectories for Junior High School Graduates

Figure 7: Observed and Counterfactual Marriage Trajectories for High School Graduates

Figure 8: Observed and Counterfactual Marriage Trajectories for Junior College/Vocational School Graduates

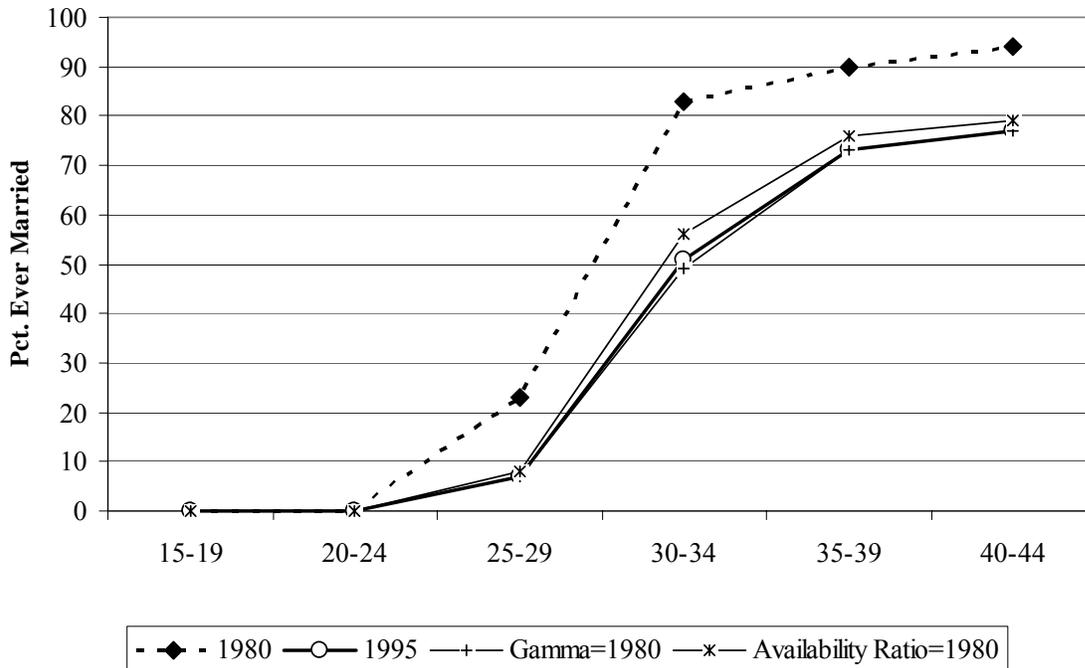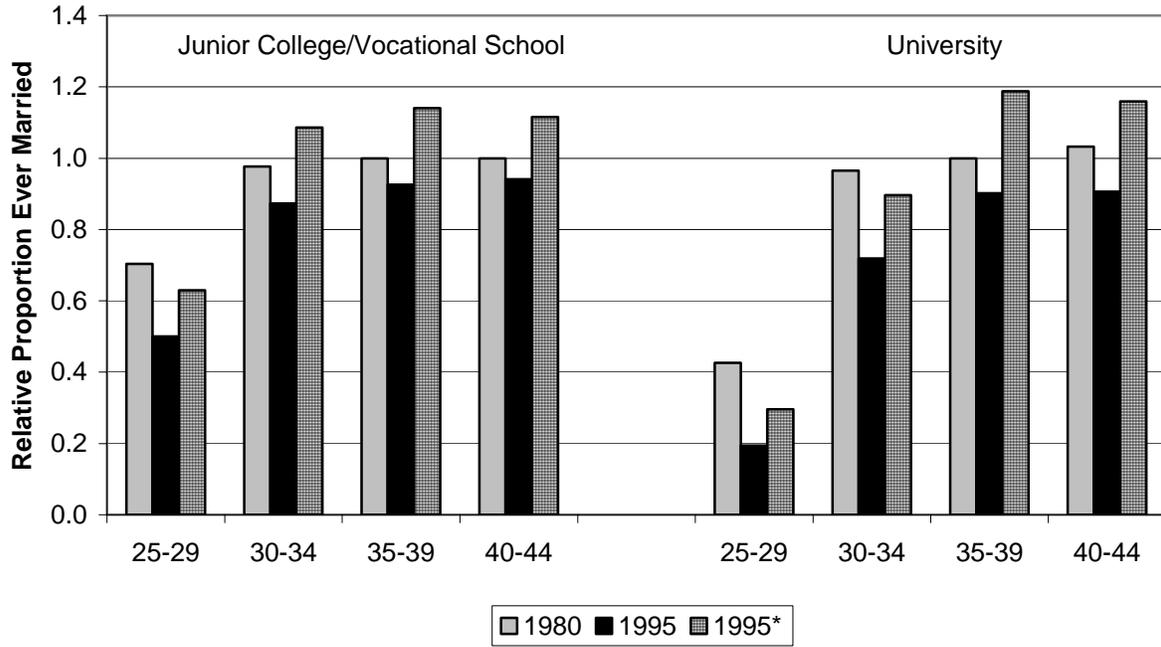Figure 9: Observed and Counterfactual Marriage Trajectories for University Graduates

Figure 10: Observed and Counterfactual Proportions Ever Married, Relative to High School Graduates