**The Perils of Single Life in Contemporary Japan**

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*Journal of Marriage and the Family*, Vol. 55, No. 1 (Feb., 1993), 191-204.

Stable URL:
http://links.jstor.org/sici?sici=0022-2445%28199302%2955%3A1%3C191%3ATPOSLI%3E2.0.CO%3B2-C

*Journal of Marriage and the Family* is currently published by National Council on Family Relations.

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# The Perils of Single Life in Contemporary Japan

*A comparison of mortality patterns by marital status in 16 industrialized countries revealed that levels of mortality experienced by single Japanese have been staggeringly high in comparison with those of married Japanese or of singles elsewhere. In this paper, we use a variety of data sources to explore several explanations for the Japanese mortality pattern. Evidence from anthropological studies and attitudinal surveys indicates that marriage is likely to have been and probably continues to be more selective with regard to underlying health characteristics in Japan than elsewhere. However, causal explanations related to the importance of marriage and the family in Japanese society probably contribute to the excess mortality of the single population.*

During the post-World War II period of rapid industrial growth, Japan experienced several major demographic revolutions. Life expectancy increased dramatically to what is now the highest level in the world, fertility decreased precipitously to one of the lowest rates in the world, and age at marriage increased to values currently higher than those experienced in most other countries (Kono, 1991; Tsuya, 1991). Such dramatic demographic trends were accompanied by sweeping social, cultural, and economic changes. For example, the marriage process underwent major transformations from an arranged system to one based largely on free choice of mates, nuclear families frequently replaced the larger multi-generational households of earlier generations, and women entered the labor force at unprecedented rates (Kono, 1991; Long, 1987; Ogawa, 1991). Nevertheless, despite such extensive changes over the past 40 years, marriage and the family have retained their position as critically important institutions in modern Japanese society. Indeed, at least through the 1980s, the vast majority of Japanese men and women eventually married and relatively few obtained a divorce, particularly in comparison with individuals in Western industrialized societies.

As several scholars have previously noted, one of the consequences of the pervasiveness of marriage and strong family ties has been the resulting discrimination and stigma associated with Japanese who do not marry or who become divorced (see, e.g., Lebra, 1984). What everyone has failed to notice, however, is that these unmarried individuals, on average, experienced an additional severe handicap—namely, relatively high rates of dying and presumably much poorer health. For example, mortality data for the mid-1900s indicate that a 20-year-old Japanese man or woman who remained single could expect to live as much as 15 years less than his or her married counterpart. Such a magnitude of difference in life expectancy is not only enormous in absolute terms, but, as shown below, far exceeds corresponding values observed in other industrialized countries.

On the other hand, the finding that unmarried persons anywhere experience higher mortality or

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lower life expectancy than the married is not a new one. Indeed, in literally hundreds of studies dating as far back as the mid-1800s, researchers have shown that married men and women have greater longevity, and experience better health in general, than do single (i.e., never-married), widowed, and divorced persons. These differences are often largely attributed to a wide array of benefits associated with marriage, sometimes referred to as *marriage protection*. For example, based primarily on studies in the United States and Europe, social scientists have argued that the increased social ties and networks that result from marriage facilitate access to medical information and services, constrain risk-taking behavior and encourage healthy behavior, act as a buffering mechanism in stressful situations, substitute for formal health care, and provide additional economic resources that affect the frequency and quality of health care services (e.g., Berkman, 1984; Blazer, 1982; Umberson, 1987; Weiss, 1973). Some have even gone so far as to suggest that marriage be promoted as a means of improving the general health status of society and extending the lifespan (Christensen, 1988). One could readily speculate that such marriage protection mechanisms operate more strongly in Japan than elsewhere. Not only does marriage imply strong forms of economic, social, and psychological support in Japan, but it is likely that unmarried persons face further deprivations because of the general unacceptance of the single and divorced statuses in Japanese society.

However, there is another possible explanation for the unexpectedly high mortality experienced by single persons, one typically referred to as *marriage selection* (on the basis of health characteristics). That is, if mentally and physically healthier persons are more likely to get married than the frail or unhealthy, married people could appear healthier than their never-married counterparts in the absence of any causal or protective aspects of marriage. Whether they do so explicitly or implicitly, most researchers examining data from industrialized countries ultimately conclude that marriage selection factors are probably less important than causal influences in producing the higher death rates and poorer health among unmarried persons. While the basis for such inferences is in and of itself dubious (Goldman, in press), we also need to consider the extent to which such inferences (even if legitimate) can be generalized across populations. In particular, there is little doubt that the Japanese marriage system—particularly the arranged marriage process which was dominant earlier in the century—differs radically from the marriage process of other industrialized societies. As described below, the critical distinction from our point of view has been the focus of the Japanese arranged marriage system on the mental and physical health status of the potential spouse and his or her family. Thus, it seems at least plausible that the marriage selection process may be more important in accounting for the relatively high mortality among singles in Japan than elsewhere.

Our objective in this paper is to consider the evidence in favor of selection and causal explanations for the unusual mortality patterns experienced by never-married Japanese. We begin by comparing the Japanese mortality patterns with those observed in other industrialized countries and by demonstrating that the Japanese patterns are unique in several respects. Next, we present a variety of findings—from our own analyses as well as from external studies—that suggest that certain characteristics of the spouse selection process in Japan may well account for the relatively low life expectancies observed among singles, particularly in the middle of this century. At the same time, however, we acknowledge that the existing data do not rule out a causal explanation. Thus, we also assess the plausibility of the hypothesis that the excess mortality experienced by never-married Japanese derives largely from the protective aspects of marriage and the relative disadvantages of single life in Japan. Finally, we consider the mortality prospects for future generations of single Japanese.

## Mortality Patterns by Marital Status

### *Distinct Mortality Patterns in Japan*

A recent comparative analysis, designed to explore the extent to which mortality patterns by marital status were similar across 16 industrialized populations over the past several decades, revealed that patterns among single Japanese were distinct from those in most other countries in several ways (Hu & Goldman, 1990). In this study, excess mortality among the unmarried was assessed by a measure of relative risk known as the *relative mortality ratio*—the ratio of the death

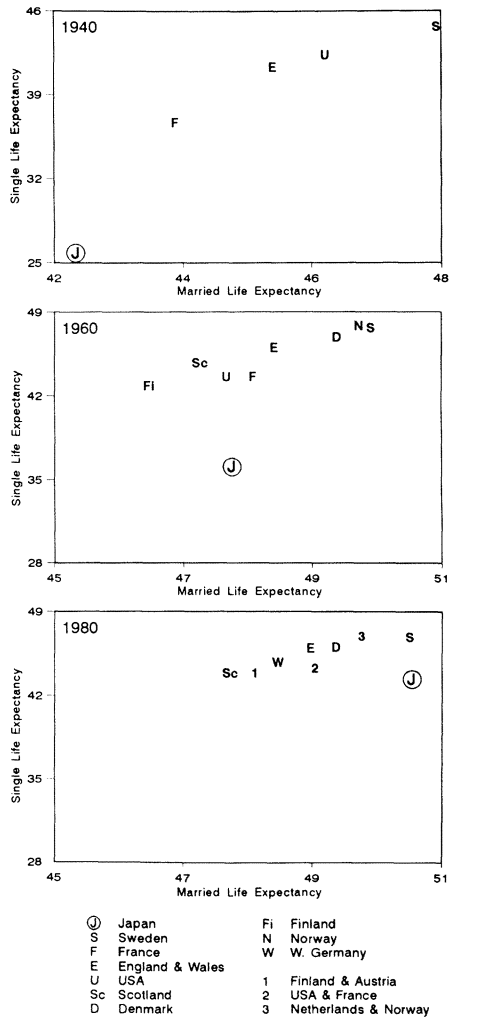
rate of singles to the death rate of married persons; the relative mortality ratios were derived from a multivariate model of the death rate that controlled for age and time period. The first finding of the comparative analysis was that the magnitude of the excess mortality experienced by Japanese single men and women (relative to their married counterparts) far exceeded values observed elsewhere. For example, while single persons in each country had death rates greater than the married (typically by a factor between one-and-a-half and two), the death rate for single persons in Japan was at least *three* times as high as for married Japanese. Second, the sex differences in excess mortality of singles in Japan differed from sex differences elsewhere. Specifically, Japanese women experienced levels of excess mortality almost as high as single Japanese men, in contrast to the higher excess mortality observed among single men in other countries. Third, the time trend in the excess mortality of Japanese singles was opposite to trends in most other countries: The magnitude of the excess mortality experienced by single Japanese men and women declined substantially from the 1950s to 1980, while single persons living elsewhere typically experienced increasing levels of excess mortality. And, fourth, the age patterns of excess mortality among single Japanese women differed from the age pattern observed in other industrialized countries. In particular, elderly single Japanese women experienced levels of excess mortality almost as high as those experienced by middle-aged women. By contrast, in most countries and among Japanese men, the levels of excess mortality declined steadily from middle to old age.

The unique aspects of the Japanese mortality pattern described above all pertain to the single population. There is one additional way in which the Japanese mortality patterns by marital status were unusual. Divorced Japanese men, but not divorced Japanese women, experienced mortality rates as high as their single counterparts (a relative mortality ratio of about three). In most other countries, divorced persons of both genders experienced relatively high mortality—in fact, their mortality was typically much higher than that experienced by the singles. Nevertheless, we do not consider the formerly married in this analysis for the following two reasons. First, widows and widowers in Japan, as well as divorced women, experienced levels of excess mortality similar to those experienced by their counterparts in other industrialized countries. And second, formerly married persons are affected by several successive mate selection processes (i.e., getting married, divorcing, and not remarrying) that makes analyses of selection factors considerably more complicated and difficult to interpret.

### *An Examination of Life Expectancy by Marital Status*

The exceptionally high mortality of never-married Japanese can be demonstrated by an examination

FIGURE 1. LIFE EXPECTANCIES FOR SINGLE AND MARRIED MEN

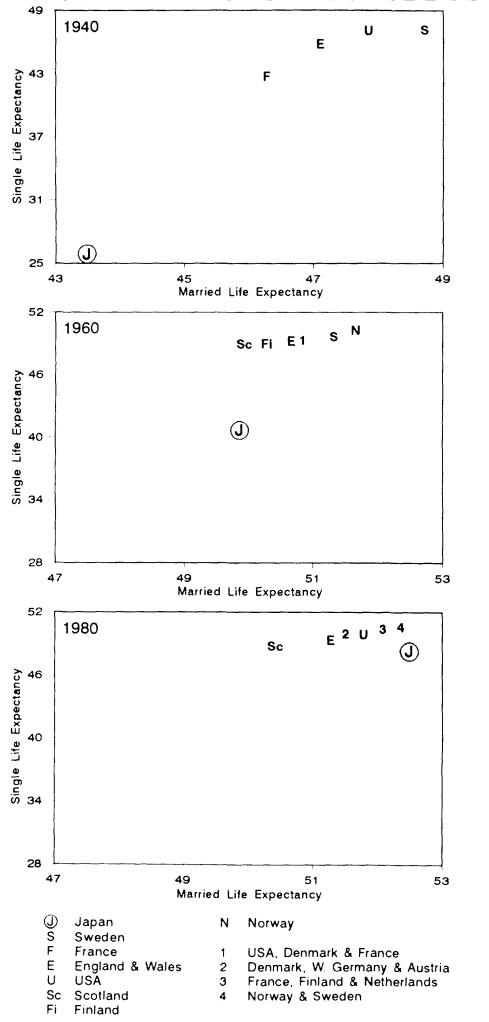


of life expectancies of the single and married populations of various countries. These life expectancies denote the average number of years that persons could expect to live between the ages of 20 and 75, if they remained in the single or married state respectively throughout these ages. The life expectancies are based on marital-status specific death rates for the designated year and gender and are truncated at 75 since people who continue to be married at ages over 75 are a progressively more select group among survivors of similar ages.

Single versus married life expectancies for countries with available data are shown in Figures 1 and 2 for men and women respectively for the years 1940, 1960, and 1980. These graphs depict both the striking magnitude of the excess mortality of single Japanese in the past and the enormous improvements in mortality for both single and married persons in Japan relative to other countries. In 1940, for example, single women in Japan had a life expectancy between 17 and 22 years lower than the values for single women in the United States, Sweden, England, and France, and about 17 years lower than comparable life expectancy for married Japanese women! Differentials for unmarried Japanese men were almost as large. By 1960, these differences had declined but remained considerable: for example, about a 10-year disadvantage for single Japanese women relative to both single women in the other countries and married Japanese women. By 1980, these differentials had decreased substantially, although life expectancy for never-married Japanese remained the lowest of the 12 countries shown and was about 4 years below that for married Japanese women and 7 years below that for married Japanese men. It is interesting to note that while Japan was experiencing enormous gains in life expectancy among singles, other countries showed little improvement or even declines in single life expectancy, particularly during the period between 1960 and 1980. In addition, over this 40-year span, life expectancy among married persons in Japan evolved from the lowest to the highest among the countries shown here.

What factors can account for the atypically high mortality rates experienced by single Japanese men and women, expecially in the middle of the century? We begin by exploring the extent to which the spouse selection process could have resulted in large but declining mortality differences between never-married and married Japanese.

FIGURE 2. LIFE EXPECTANCIES FOR SINGLE AND MARRIED WOMEN




## MATE SELECTION AND EXCESS MORTALITY

### *Health-Related Aspects of the Mate Selection Process*

During the Meiji Period (1868-1912), arranged marriages—which had been common among the *samurai* class in pre-modern Japan—spread to most levels of society. The decision to arrange a marriage typically rested with the head of the family or the household, although the arrangements

(as well as the initiation of the match) often involved a mediator or go-between known as a *nakōdo* (Hendry, 1981; Taeuber, 1958; Vogel, 1961). A typical arrangement might involve a series of discussions between the two families and the go-between, as well as a formal meeting (*miai*) involving the eligible young man and woman and members of the two families. If the *miai* was successful, a formal engagement would follow within a few months; if not, subsequent *miai* involving other potential spouses might be arranged in the future.

Whether or not a formal *miai* actually took place, the arranged marriage practice had several characteristics that reduced the chance of physically and mentally handicapped candidates being selected as potential spouses. One was the extreme importance of the health status of the potential spouse as a criterion for selection. A second attribute of the marriage process was the inclusion of family members and outsiders in the selection process. And, as we shall see later, a third related characteristic was the efficiency of the mate selection process: At least 95% of Japanese men and women eventually married.

Several scholars stress the importance of family characteristics, in addition to individual criteria, in the selection of a suitable spouse. Such characteristics included the family's status and wealth, the health and longevity of its members, and the strength of the family line (Dore, 1958; Vogel, 1965). One of the most important concerns for the Japanese family was to avoid contamination of the blood line with disease, and families were particularly fearful of certain hereditary and psychological diseases (Hendry, 1981). Although the go-between often had formal responsibility for negotiating the marriage, various people—including friends, neighbors, shopkeepers and even private detectives—would provide information about the prospective spouse and his or her family. The evidence from a number of anthropological studies suggests that the inclusion of family members and outsiders in the process of arranging a marriage did indeed reduce the chances that physically or mentally unhealthy candidates would be chosen for marriage. In their efforts to glean information about the health status of the potential spouse, a family might call the potential spouse's school or office to check for medical absences, or use private detectives—principally in the cities—to assess the likelihood of defective genes in the family line—for example, because of mental illness or the presence of a Hiroshima victim in the family (Condon, 1985; Hendry, 1981; Vogel, 1961). In the past, a family might also have requested copies of the potential spouse's family records at the registry offices; however, it is now forbidden to see family records except for one's own.

It also seems probable that the very high rates of tuberculosis infection among the Japanese population played an important role in the marriage process. Tuberculosis was a leading cause of death in Japan from the beginning of the 20th century until the late 1950s. Dore (1958, p. 66) argues that tuberculosis was the most feared disease in Japan around 1950, in part because of its high prevalence, but also because of the belief that the disease was inherited and "might damage the family's chances in the marriage market."

The mate selection process may have contributed further to the creation of an unhealthy single population because of the importance of social class and financial transactions in the arranged marriage process. To the extent that wealth and social position enhanced a family's chances of arranging marriages for their children and offset the barriers resulting from a child's physical or mental handicaps, impaired persons of low social class would have been those least likely to secure a spouse. These persons would have suffered the additional health-related disadvantages resulting from poverty and low education.

Recent evidence for the importance of health-related selection criteria in the mate selection process comes from a 1983 survey. A total of about 9,000 couples under age 65 were asked to assess the relative importance of 17 factors in the mate selection process (Imaizumi & Kaneko, 1985). "Health" ranked either first or second for husbands and wives of all marriage cohorts. Perhaps more revealing is the fact that about half of the respondents rated "relatives' genetic diseases" as "very important" or "moderately important."

### *Universality of Marriage*

As suggested earlier, an important and related characteristic of Japanese marriages during the past several decades has been the near universality of marriage. Marriage in Japanese society has been viewed as an essential stage in the transition toward adulthood and has been considered neces-

sary for the maintenance of the *ie* (roughly translated as "family" or "household") as well as for procreation. Moreover, failure to marry has carried severe implications of immaturity and lack of moral responsibility, as well as the possibility of stigma—particularly, for women (Edwards, 1989; Lebra, 1984). The importance of marriage in Japan is evident from its continued high prevalence. For example, between 1940 and 1960, 3% or fewer of Japanese women and men in their 40s had never been married; data for the most recent two decades indicate only modest changes in the proportion of Japanese men and women who have never married (Tsuya, 1991). By contrast, the size of the never-married population aged 40 and over in Western European countries and the United States typically hovered about or even exceeded 10%.

Given these comparisons, one might speculate that the small size of the single population in Japan could *account statistically* for its high mortality. Indeed, several scholars have hypothesized that populations in which the vast majority of persons ultimately marry should be characterized by greater selectivity effects (such as health problems) among those who remain single than the populations in which substantial proportions never marry (Fuchs, 1974; Kisker & Goldman, 1987; Livi-Bacci, 1985). However, the relationship between the percentage of a population that remains single and the (relative) mortality rate of singles is more complicated than it first appears. As shown recently by the use of a simple simulation model, marriage selection on the basis of health need not result in a negative relationship between the proportion remaining single and the mortality rate of singles (Goldman, in press). Whether or not the hypothesized negative relationship emerges depends critically on what aspects of the mate selection process vary across countries. In particular, do we see a smaller fraction of the population remaining single in Japan than elsewhere because healthy Japanese rarely elect to remain single (in contrast to healthy persons elsewhere), or because handicapped Japanese are more likely to marry than their counterparts in other countries, or because the size of population deemed to be unhealthy or handicapped is smaller in Japan? The answers to such questions—which, unfortunately, remain largely unknown—ultimately determine how the relative size of the single population is related to its mortality.

The problem is further complicated by the fact that the presence of a negative relationship between the relative size and the mortality rate of the single population does not necessarily imply that selection factors are important in explaining the observed mortality differences between single and married persons. For example, some social scientists argue that a negative relationship between the relative size and excess mortality of the single population results from role conflicts and high levels of stress which are associated with being members of infrequently occupied groups or statuses (e.g., Dodge & Martin, 1970). One finding from the 16-country study discussed earlier illustrates the complicated nature of making inferences from the size of the single population. The percentages remaining single over the past several decades in Taiwan were even lower than those in Japan; yet, single Taiwanese experienced *lower* levels of excess mortality than their Japanese counterparts (Hu & Goldman, 1990).

Although it is not legitimate to make statistical inferences about the role of the mate selection process from the sheer size of the single population, evidence from anthropological studies suggests that two characteristics of the Japanese marriage system—high rates of marriage and the selection of future spouses on the basis of characteristics related to health—led to both a small and a relatively unhealthy single population. That is, strong societal pressures to marry meant that virtually all Japanese who could marry did so; and the relatively few who failed to marry were likely to have had some form of handicap—either themselves or within their family. For example, in a social anthropological study carried out in the village of Kurotsuchi during the mid-1970s, Hendry (1981) comments that all but three adults over age 30 (out of a total of 140) had married, and that each of these three had suffered health problems. Similarly, Embree (1939, p. 89) notes that, in the rural village of Suye Mura in the 1930s, virtually everyone was married "except for one or two feeble-minded persons." Note, however, that mental and physical limitations did not necessarily relegate a person to a life of celibacy. For example, Hendry (1981) and Cornell (1984) argue that the near universality of marriage in Japan implied that a family whose child suffered from an im-

pediment or handicap was often forced to accept a potential spouse from a similar family. It seems likely that mental and physical impediments forced some persons to marry handicapped or otherwise disadvantaged mates, while other individuals—perhaps those with more serious impediments or from lower social classes—remained single involuntarily.

### *Time Trends*

Further support for the importance of marriage selection in accounting for the excess mortality of single Japanese comes from observations of concomitant changes in the Japanese marriage process and in the magnitude of the excess mortality of the single population. During the post-war period, the prominence of *miai* declined as *renai*, or "love marriage," replaced the traditional arranged marriage. Marriages became progressively less likely to have been arranged by families or a go-between and the formal meeting (*miai*) between potential spouses became considerably more relaxed and varied in form. Numerous surveys carried out over the past several decades indicate that, over a relatively short period of time, *miai* marriages were outnumbered by *renai* marriages. For example, surveys indicate that, between the marriage cohort of the late 1940s and that of the late 1980s, the frequency of arranged marriages declined precipitously from 74% to 24% (Atoh, 1990; Long, 1987). Although arranged marriages continued to be more common in rural areas and in the upper and lower social classes (in contrast to the middle class), the data indicate that the overall proportion of respondents who characterized their marriages as *renai* rose dramatically over the past several decades (Long, 1987).

It is important to recognize that many scholars question the dichotomous categorization of marriages used by these surveys and argue that the distinction between *miai* and *renai* marriages is often ill-defined, especially in recent years. In particular, they note that many marriages classified as *renai* involve parents, go-betweens, and friends at various stages of the mate selection process and that marriage decisions among young persons continue to be made jointly with family members (Edwards, 1989; Hendry, 1981; Lebra, 1984; Tsuya & Choe, 1991; United Nations, 1984). Nevertheless, while the validity of the numerical estimates may be questionable, few social scientists challenge the notion that recent Japanese marriage cohorts have had considerably more latitude than earlier ones in the choice of a spouse.

While the arranged marriage system was becoming considerably weaker, the excess mortality experienced by the single population declined dramatically. The death rates of single relative to married Japanese decreased by as much as 40% between 1955 and 1980. We saw in Figures 1 and 2 that life expectancy among singles in Japan actually increased between 1960 and 1980, while singles in other countries often experienced declines in longevity.

Although difficult to prove, it is likely that the changing nature of the Japanese marriage system accounted for much of the observed reductions in the levels of mortality of single Japanese. As the prevalence of arranged marriages declined, family criteria for establishing a match became less important than the compatibility of the couple itself (Vogel, 1961). One could argue that, at the same time, the importance of health as a criterion for spouse selection decreased. There is some evidence to support this hypothesis. Vogel (1965) notes that families today are most likely to rely on the potential spouse's education or quality of school—as opposed to the family's health and wealth status—in their evaluations. (Although social and economic factors are probably related to the health status of the future spouse, spouse selection on the basis of socioeconomic attributes would have less impact on subsequent mortality than direct health-related selection criteria.) Moreover, in the 1983 survey referred to above, more recent marriage cohorts were only half as likely as earlier cohorts to consider "relatives' genetic diseases" as an important factor in selecting a spouse, and they were considerably more likely to select "personality" or "attitude toward life" as major considerations. This change in the preference profile for future mates was accompanied by another important change over the past few decades in Japan: the replacement of infectious diseases by chronic diseases as the leading causes of death. The precipitous decline in the prevalence of tuberculosis and other respiratory and gastro-intestinal infections (which often occurred at relatively young ages) may simply have made it progressively less feasible for potential spouses to be chosen on the basis of observable health limitations.

It also seems plausible that, over the past several decades, a progressively larger proportion of the single population consisted of individuals who preferred to remain single for reasons not related to health status. This may have been especially true for women. The educational achievement of Japanese women increased dramatically in recent years (Tsuya & Mason, 1992), and recent surveys indicate that the most educated women are those who are least likely to be married (Atoh, 1990). Data on employment similarity indicate that single women in the 1980s are considerably more likely than their predecessors to be employed in professional and technical positions (Japan Statistics Bureau, 1955, 1965, 1980). Attitudes toward marriage have also been changing: For example, young people today are considerably less likely than their counterparts 20 years ago to consider marriage necessary for the happiness of women (Tsuya & Mason, 1992). Since persons of higher socioeconomic status typically live longer than lower-status individuals (Kitagawa & Hauser, 1973; Morio & Takahashi, 1986), increases in the proportion of persons remaining single for reasons related to career aspirations probably have contributed to the decline in the excess mortality of Japanese singles.

### *Gender and Age Differences*

Few scholars discuss whether and how the nature of the marriage arrangements differed by gender. It is quite possible that health factors were more important for selection of the bride than for the groom since the former was chosen for her presumed ability to bear healthy children. For example, Blood (1967, p. 5) notes that the bride's family tree was examined for "criminal acts and mental or physical illness presumed to be hereditary and likely to introduce weakness into the husband's genetic line." Similarly, Benedict (1946) argues that a major concern of the husband's family was the selection of a bride suitable for perpetuation of the family line. In addition, it appears that societal pressures to marry at the appropriate age (a concept known as *tekireiki*) bear more heavily upon the bride and her family than on the groom (Lebra, 1984). In such circumstances, a woman who has reached marriageable age may be more likely to accept spouses whose backgrounds have not been thoroughly scrutinized or who have known health limitations. In summary, it appears as if health factors have been at least as important, if not more important, in the selection of a bride than in the selection of a groom. This pattern is consistent with the observation that, unlike in other industrialized countries, single women in Japan face excess mortality risks as high as those experienced by single Japanese men.

Can the mate selection process also explain the unusual age pattern of excess mortality observed among single Japanese women—namely, levels which remain high and relatively constant from middle through old age? (Levels of excess mortality among single Japanese men, as well as among single men and women in other countries, generally decline steadily from about age 40 onwards.) The answer is affirmative, if we also believe that marriage selection on the basis of health factors operated more strongly among women than among men. Since the older women married during an era when arranged marriages were dominant, their relatively high level of excess mortality could result from their comparatively high probability of having been denied marriage because of health limitations. Indeed, patterns of excess mortality among singles *by birth cohort* do reveal *declining* levels from middle to old age among Japanese women. Such declines among single Japanese women are not apparent, however, when mortality data are examined in the usual manner—that is, for a particular year or period of several years.

We have argued above that various characteristics of the Japanese mate selection process are consistent with the fact that Japanese singles have experienced much higher mortality relative to their married counterparts, in comparison with formerly married Japanese and with singles in other countries. We have also indicated that changes in the marriage process since the mid-1900s and gender differences in the criteria for mate selection could plausibly account for the declining levels of excess mortality among the singles, the higher than expected levels among single women relative to single men, and the higher than expected levels among older single women. Below, we explore whether information on cause-of-death provides further support for the marriage selection hypothesis.

TABLE 1. RELATIVE MORTALITY RATIOS BY CAUSE OF DEATH, FOR SINGLE JAPANESE (1975–1985)

| Cause | Males | Females |
|---|---|---|
| Mental disorders | 11.1 | 10.6 |
| Infective/parasitic diseases | 5.7 | 4.3 |
| Homicide | 5.3 | 2.2 |
| Suicide | 4.0 | 3.0 |
| All other external causes | 3.5 | 3.8 |
| Cirrhosis of the liver | 3.4 | 2.8 |
| Diabetes mellitus | 3.0 | 2.4 |
| Hypertensive diseases | 2.8 | 3.3 |
| Cerebrovascular diseases | 2.3 | 2.4 |
| Motor accidents | 2.2 | 1.9 |
| Ischemic heart diseases | 2.1 | 2.9 |
| Cancer of digestive system | 1.3 | 1.7 |
| Leukemia | 1.2 | 1.4 |
| Respiratory cancer | 1.2 | 2.4 |
| Remaining causes[a] | 3.2 | 3.3 |
| All causes | 2.7 | 2.7 |

Note: The relative mortality ratios denote the cause-specific death rate for singles divided by the cause-specific death rate for married persons, and are estimated from a statistical model that controls for age group. Causes of death are based on the 8th and 9th revisions of the International Classification of Diseases. See Hu (1990) for further details.

[a]Consists primarily of chronic diseases.

## MORTALITY BY CAUSE OF DEATH

Can information on the diseases or causes from which single and married people die help us to gauge the importance of the mate selection process in accounting for the excess mortality among singles? Although many scholars in the past have maintained that data on cause-of-death enhance considerably our understanding of the relative importance of selection and causal mechanisms, we argue on the basis of Japanese data that the answer is not at all straightforward.

As shown in Table 1, mortality data by cause-of-death for Japan during the period 1975–1985 (the only years for which cause-of-death data by marital status were available) demonstrate that Japanese single males and females are more likely to die from every one of the specified causes than are their married counterparts (Goldman & Hu, in press; Hu, 1990). The magnitude of excess mortality among singles varies dramatically by cause. For example, single Japanese men and women are about 11 times more likely to die from mental disorders—which include such diagnoses as senility, schizophrenia, drug and alcohol dependence, and personality disorders, but not suicide—and about 4 to 5 times as likely to die from infectious and parasitic diseases than are married people. The magnitude of the excess is considerably lower for most other diseases; for example, single men and women are between 1.2 and 3 times as likely to die from various cancers, heart disease and stroke as are their married counterparts.

The large differential between single and married people in the likelihood of dying from mental disorders suggests that those involved in the mate selection process were probably successful in their efforts to screen out the mentally disabled from marriage. Large differentials for infectious diseases are also consistent with selection mechanisms described earlier—namely, the desire to prevent infected (e.g., tubercular) individuals from marrying. Nevertheless, there are several serious problems in using these data to make inferences about the importance of marriage selection.

One problem arises because some of the diseases or causes for which singles have the highest relative probability of dying are also causes from which relatively few people die overall. Mental disorders and homicide are two examples of such causes: Single men are 11 times as likely as married men to die from mental disorders and 5 times as likely to die from homicide, but deaths from both of these causes are rare in Japan. (Of course, it is likely that there are substantial associations among diseases and potential causes of death so that, for example, persons suffering from mental disorders would be more likely to die from suicide or from accidents.) Hence, rather than determine the causes which are characterized by the largest differentials between single and married people—the strategy most commonly used by other researchers to make inferences about selection versus causal factors—we should ascertain the causes which numerically account for the differences in longevity between single and married Japanese.

A new measure, the hypothetical mortality ratio, was developed for just this purpose (Goldman & Hu, in press; Hu, 1990): For each specified cause, this measure quantifies the amount by which mortality among singles would be higher than among the married, *if the death rate for this cause were the only one to differ between the two groups.* On the basis of this measure, Table 2 presents the five leading causes in order of their contribution to the excess mortality of single men and single women respectively. For example, suicide is the single most important cause among single men (accounting for about 15% of their overall excess mortality), while cerebrovascular disease (stroke)

TABLE 2. CAUSES OF DEATH ACCOUNTING FOR EXCESS MORTALITY AMONG SINGLES

| Male | Female |
|---|---|
| 1. Suicide | 1. Cerebrovascular diseases |
| 2. Cerebrovascular diseases | 2. Suicide |
| 3. Other external causes | 3. Cancer of digestive system |
| 4. Cirrhosis of the liver | 4. Ischemic heart diseases |
| 5. Infectious/parasitic diseases | 5. Infectious/parasitic diseases |

is most important among single women (also accounting for about 15% of their excess mortality).

Table 2 reveals the ultimate difficulty of drawing inferences about the importance of selection factors from cause-of-death data. Most of the excess mortality of the single population derives from causes which could be identified with either selection or causal hypotheses. For example, the lower suicide death rates experienced by married people may well result from emotional or other psychological and social benefits derived from the presence of a spouse and the associated familial and social networks. However, it is also credible that the higher rate of suicide among singles evolves from the marriage selection process—namely, the reduced likelihood of marriage among emotionally unstable or mentally disabled men and women. Similar competing explanations would apply to cirrhosis of the liver—an important source of the excess mortality among single men, and one that is strongly related to the prevalence of alcoholism. Indeed, it is important to recognize that a large differential for almost any cause of death could be attributed to either a selection or protection mechanism. Even differentials for causes that are primarily genetic in nature and frequently appear prior to marriageable age (e.g., diabetes) could be associated with protection mechanisms since marriage offers increased social networks, better economic well-being, and more likely compliance with recommended medical regimes—factors which are likely to extend the longevity of a person with the disease.

This problem is compounded by the fact that many of the designated causes in the table above are chronic diseases which account for the majority of deaths among the Japanese population as a whole. That is, cancer, heart disease, and cardiovascular disease have been the three leading causes in Japan since the late 1950s, and hence account not only for much of the excess mortality among singles, but also for most of the overall deaths among the entire population. Moreover, each of these broad disease categories is associated with a large number of known (and probably unknown) risk factors, including dietary and life style factors (e.g., smoking, alcohol consumption, diet, obesity, and level of activity) as well as stress and hypertension (Rothenberg & Koplan, 1990). For example, high risks of stroke among Japanese men have been associated with high alcohol intake and certain aspects of a traditional Oriental diet (including high salt intake and low intake of food from animal sources; Reed, 1990). Although many scholars have argued that marriage acts as a buffer against stress, inhibits risk-taking behavior, and leads to healthier life styles, we suggest that personal characteristics more frequently found among the never-married (including emotional problems and mental disability) are also likely to be related to risk factors for the principal chronic diseases. One obvious limitation of using cause-of-death data to support marriage selection hypotheses is the difficulty of identifying *specific* selection mechanisms associated with the Japanese marriage process that would ultimately account for higher mortality from *chronic diseases* among the never-married population.

## ALTERNATIVE EXPLANATIONS

### *Errors in the Data*

There are two alternative explanations to marriage selection that could account for differences in longevity between the single and the married Japanese population. The first, and the less plausible one, is that the ostensibly high mortality rates for single Japanese are largely an artifact of data reporting errors. For example, some have argued that since population censuses typically undercount unmarried persons, who are generally more difficult to locate than married individuals, the reporting death *rate* among unmarried persons might be correspondingly overestimated (Berkson, 1962). However, given the generally high quality of Japanese census and death registration data, it is difficult to imagine that these types of

problems either could produce large distortions of the true rates or could affect the Japanese data more than those from other industrialized countries (Goldman & Hu, in press).

### *Marriage Protection and Excess Mortality*

A more reasonable explanation is that the observed differences result largely from causal processes (often referred to above as *marriage protection*) rather than from selection mechanisms. As noted earlier, many social scientists have argued that the increased social ties, interpersonal relationships, and psychological and economic support that result from marriage lead to generally healthier life styles, greater psychological well-being, fewer risk-taking behaviors, and an enhanced ability to maintain good health or at least combat disease. At the same time, failure to enter the normative state of marriage is hypothesized to result in psychological distress, role conflicts, and ultimately higher morbidity and mortality.

The undeniable importance of marriage and the family in Japanese society, combined with strong sex role differentiation, makes such marriage protection hypotheses at least as tenable in Japan as elsewhere. Although the nature of marriage, the marriage process itself, and the structure of the Japanese household have changed dramatically over this century, marriage continues to be almost universal in modern Japanese society and has been considered a necessary step in the life cycle for both men and women.

Much has been written about the traditional Japanese husband-wife relationship in which the man assumes the role of breadwinner and the woman as caretaker of the home, the husband, children, and frequently the in-laws. Although the extent to which women exercise power within the household varies by level of education and social class and may be increasing over time, scholars note the continued strong sex differentiation of marital roles in Japan (Long, 1987). Numerous recent sample surveys indicate that although husbands have become progressively more likely to support the *notion* of greater equality between the sexes, their average contribution to household and childrearing tasks continues to be minor (Imamura, 1987; Tsuya & Choe, 1991). The middle class salary man, in particular, depends upon his wife for all of the "backstage work" necessary for him to function well in his demanding workplace. The Japanese woman has also been dependent upon marriage, although in different ways. At least until very recent years, a Japanese woman's life was considered meaningless without marriage (and certainly without children), and her personal and economic security were derived, for the most part, from her marriage (Vogel, 1978; Lebra, 1984; Condon, 1985). In spite of the demands placed upon married Japanese women—especially those who pursued a double career of housewife and outside employment—it appears that few women opted for single life (Lebra, 1984).

What is less clear is the *extent* to which differences in the social and economic environment of single and married persons could account for the observed differences in longevity. For example, do the better employment prospects faced by married men ultimately lead to lower rates of disease and mortality, and, if so, by how much? Once again, this type of question is virtually impossible to answer, at least from available cross-sectional data. There is no question that married Japanese men are better off economically than their single counterparts—for example, around 1960, about one third of middle-aged single men were unemployed in contrast to only 3% of married men (Japan Statistics Bureau, 1955, 1965, & 1980 Censuses). In addition, there is little doubt that employed men live considerably longer than the unemployed: In 1980, unemployed men had a life expectancy about 15 years lower than persons in most occupations (Ishikawa, 1985). What is uncertain, however, is the direction of cause and effect. It seems highly probable that health-related criteria which affect marriage prospects also determine employment prospects: Disabled persons are less likely to marry or to find regular employment, or persons who are unemployed (because of poor health or otherwise) find it more difficult to marry.

We noted earlier that a strong argument in favor of selection hypotheses was that such explanations could plausibly account for each of the aberrant mortality patterns detected in the cross-national study—namely, declining levels of excess mortality over time, levels of excess mortality among single females as high as those among single males, and sustained high levels among older single females. Can causal mechanisms also explain such patterns?

The answer seems to be a qualified yes. It is possible that discrimination against women in

social interactions as well as in the labor force has led to smaller gender differences among singles in Japan than elsewhere. It is also plausible that the importance of family support of the elderly in Japan, and the relative scarcity of long-term health care facilities, has restricted health-care options for elderly singles. Even in recent years, the majority of Japan's aged were living with one of their children (about two thirds as of 1985), and not until 1983 were institutions for long-term care of the elderly officially approved by the government (Martin, 1989). Nevertheless, there is no obvious explanation as to why such factors should lead to much higher mortality risks among elderly single women and not elderly single men. One might also conjecture that the rapid declines in excess mortality among single men and single women result from various social and economic processes, particularly the weakening of family ties in recent years, and the development in the early 1960s of a universal health coverage program—factors which place unmarried persons today at less disadvantage (compared with their married counterparts), than unmarried persons in the mid-1900s.

What is perhaps most troubling about each of these causal explanations, however, is the extent to which they can plausibly account for the sheer magnitude of the excess mortality among singles or the rapid decline in the excess since the mid-1900s. That is, if unhealthy persons were just as likely to marry as the healthy, is it reasonable to believe that the disadvantaged social and economic environment of single Japanese could account for most of the 15- to 20-year difference in longevity which existed in the middle of this century? Or, that in the absence of health-related marriage selection processes, single women could face almost double the mortality risks of divorced women? Or, that improvements in this environment—brought about perhaps by reduced discrimination and better access to health care—could account for an increase in longevity of as much as a decade (for single relative to married persons) in only 40 years? Such orders of magnitude are certainly beyond values typically associated with modest changes in social and economic factors. The same concerns are not present, however, when we consider the impact of marriage selection on differences in longevity. If diseases or associated risk factors can be identified at young ages and if persons bearing the diseases or risk factors can be successfully screened out of marriage, it is entirely possible for the life expectancy of the married to vastly exceed that of the single population.

## Conclusions

It would of course be naive to believe that the excess mortality experienced by Japanese singles over the past several decades has arisen solely from selection or solely from causal factors. Indeed, as has been concluded by many researchers in the past, it seems likely that both types of explanations have operated together to produce higher mortality among unmarried groups. Unfortunately, it also seems certain that the roles of marriage selection and protection mechanisms in accounting for the excess mortality of single men and women can never be adequately quantified, at least not from existing sources of data.

Our findings do suggest, however, that the relative importance of the two types of explanations has probably not remained constant over time or across location. An analysis of Japanese marriages—particularly arranged marriages in the middle of the 20th century—indicates that the screening out of mentally and physically disabled persons was an important component of the marriage process. As demonstrated here, such a mate selection mechanism could plausibly account for many of the aberrant patterns of mortality by marital status which we observe for Japan but not for other industrialized nations.

Unfortunately, many of the questions raised here cannot be satisfactorily answered with available information. Some of these issues can be properly addressed only with data from a longitudinal survey that follows men and women from before marriageable age through older ages and that collects extensive and repeated measures of health and socioeconomic status. Such data do not currently exist, at least not with sufficiently large sample sizes, and are difficult and expensive to collect. Moreover, were such data to be collected in the future, they would not help us to understand the factors underlying the enormous differences in life expectancy experienced in the past.

Can we expect recent trends of convergence in life expectancies between single and married Japanese to continue? To the extent that the differences in life expectancy result from marriage selection mechanisms, the answer is almost cer-

tainly affirmative. Recent trends in Japan indicate a continuing rise in age at marriage, and a growing segment of young persons, especially women, who approve of singlehood as an alternative to marriage (Tsuya, 1991) and who prefer never to marry at all (Sato, 1983). The evidence suggests that the never-married population in the future is likely to contain a higher proportion of individuals who choose the single state for reasons unrelated to their health status. If anything, the highly educated and career-oriented individuals who marry late are likely to have higher life expectancy than many of their married counterparts.

What is the consequence for future differences in longevity if causal mechanisms are also important in accounting for the excess mortality of Japanese singles? The answer continues to be one of convergent life expectancies between single and married persons. The progressive weakening of the traditional Japanese family, the increasing role played by the government in providing health care and old-age security, and the growing educational and professional opportunities for women should render the single state relatively less disadvantaged in the future than today. Moreover, it is likely that just the simple increase in the relative size of the unmarried population—brought about by later ages at marriage, a higher proportion never marrying, and increasing divorce rates—will reduce the extent of discrimination faced by single Japanese.

## Note

This paper was written while the author was a Fellow at the Center for Advanced Study in the Behavioral Sciences. The research was supported in part by grants from the National Science Foundation (BNS-8700864) and the Japan Foundation. I would like to thank Yuanreng Hu and Anne Pebley for their invaluable comments on an earlier draft. I am also extremely grateful to Shigemi Kono and Kyo Hanada of the Institute of Population Problems, Japan, for providing me with cause-of-death tabulations prepared for their own research on Japanese mortality.

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