Published in final edited form as:

J Marriage Fam. 2016 June ; 78(3): 780–796. doi:10.1111/jomf.12298.

Marriage and Women's Health in Japan

Sojung Lim and

Department of Sociology, Utah State University, 0730 Old Main Hill, Logan, UT 84322-0730

James M. Raymo

Center for Demography and Ecology, University of Wisconsin–Madison, 1180 Observatory Drive, Madison, WI 53706

Abstract

In this study, we evaluate alternative hypotheses about the potentially harmful or beneficial effects of marriage on women's health and examine the factors underlying observed relationships between marriage and health. Using data from the Japanese Panel Survey of Consumers, an annual survey of a nationally representative sample of Japanese women ($N = 1,610$), our study advances current scholarship on marriage and health by focusing on a context characterized by a high degree of gender inequality. Results from models employing different approaches to the potential role of health-related selection into marriage consistently indicate that marriage is associated with better mental and physical health and that the lower levels of employment among married women play an important role in explaining this relationship. Our findings highlight the importance of considering how the specific pathways linking marriage and health may vary across societies with different gender and institutional contexts.

Keywords

Gender; health; marriage; Japan; second shift

Theories of “his and her marriage” and views of marriage as a patriarchal institution harmful to women's health have a long and influential history in sociology (e.g., Bernard, 1972/1982; Gove & Tudor, 1973). However, empirical studies have consistently demonstrated that marriage is associated with better health for both men and women (see Carr & Springer, 2010; Wood, Goesling, & Avellar, 2007, for reviews). Explanations for this gap between theory and empirical evidence include the institutionalized benefits of marriage (Waite, 1995), health-related selection into marriage (Wood et al., 2007), and the increasingly egalitarian nature of marriage in the United States (Williams, 2003). An important limitation of most previous research on marriage and women's health is its focus on the United States and other Western countries (Kaplan & Kronick, 2006; Manzoli, Villari, Pirone, & Boccia, 2007; Weissman et al., 1996). The substantial changes in gender attitudes and relations that these countries have experienced in recent decades (e.g., Liu & Umberson, 2008) raise questions about whether the documented health benefits of marriage are generalizable to more gender-inegalitarian societies.

*James M. Raymo jraymo@ssc.wisc.edu.

We address this limitation by examining how marriage is associated with women's health in Japan, one of the most gender-inegalitarian wealthy countries (World Economic Forum, 2014). Our primary goal is to evaluate two alternative hypotheses: (a) marriage is bad for women's health as suggested by earlier theories of "his and her marriage," and (b) marriage is good for women's health as suggested by recent research on the United States and other Western societies. On the one hand, pervasive gender inequality (Brinton, 2001) suggests that Japan is one contemporary society in which marriage may be detrimental to women's health. On the other hand, the institutionalized advantages of marriage, including greater access to economic resources and emotional and social support (Cherlin, 2004; Waite & Gallagher, 2000; Wood et al., 2007), may play a particularly important role in enhancing women's health in a society like Japan, where alternatives to marriage are limited and economic independence is difficult for women to achieve (Brinton, 2001; Ogasawara, 1998; Yu, 2009).

A second goal is to examine factors that contribute to the observed relationships between marriage and women's health. Understanding why marriage is associated with better or worse health in a gender-inegalitarian society like Japan is important to be able to modify and extend existing theory in ways that allow for contextual specificity. To this end, we analyze longitudinal data collected between 1993 and 2002 and make explicit efforts to account for the potential endogeneity of marriage and health by comparing the results of three different model specifications: (a) simple cross-sectional models of health, (b) panel models that include lagged health, and (c) fixed-effects models that control for time-invariant, unobserved characteristics. This analytical approach will help us evaluate the extent to which observed relationships between marriage and women's health reflect the influence of marriage on health rather than health-related selection into marriage. Our findings shed new light on long-standing questions about the impact of gender-inegalitarian marriage on women's health and contribute to our understanding of variation in the health benefits of marriage across different social contexts.

Background

Previous Research on Marriage and Health

In the years since Bernard (1972/1982) depicted marriage as an institution detrimental to women's mental health, numerous studies have examined the health implications of marriage. Early scholarship suggested that the implications of marriage for health differ by gender (e.g., Gove & Tudor, 1973), but the cumulative body of empirical evidence clearly suggests that both men and women derive health benefits from marriage. The health benefits of marriage are not limited to mental health (the main focus of Bernard's study), but also include a broad range of physical health outcomes, including mortality (Murray, 2000), self-rated health status (Williams & Umberson, 2004), chronic health conditions (e.g., heart disease, hypertension) and physical functioning (Prigerson, Maciejewski, & Rosenheck, 2000). Evidence that marriage is associated with both mental and physical health is not surprising given that different dimensions of health often share common causes and affect each other (Bruce & Leaf, 1989; Ross, Mirowski, & Goldstein, 1990).

Family scholars have proposed several explanations for the observed health benefits of marriage. First, as a social institution, marriage provides rights and responsibilities that are reinforced by normative and legal structures (Cherlin, 2004). Second, marriage is economically beneficial, providing economies of scale, higher household income, and a higher likelihood of home ownership (Waite, 1995). Third, marriage may enhance health via the social support provided by spouses (e.g., House, Umberson, & Landis, 1988), an increased sense of meaning and purpose in life, and the multiple social roles associated with marriage (e.g., Burton, 1998). Fourth, married people are also more likely than their unmarried counterparts to engage in healthy behaviors, presumably as a result of spousal monitoring that encourages self-regulation (Umberson, 1992).

However, it is important to recognize that a positive association between marriage and health does not necessarily imply that marriage is good for health if healthier individuals are more likely to marry and to remain married (Wood et al., 2007). The use of cross-sectional data, and the failure to account for selection into marriage, is thus considered a major limitation of earlier studies (Waite & Gallagher, 2000). More recent studies employ longitudinal data and statistical methods that account for health-related selection into marriage (e.g., controlling for premarital health conditions, estimating fixed-effects models). These studies find that, even after accounting for health selection into and out of marriage, marriage appears to confer health benefits on both men and women (Horwitz, White, & Howell-White, 1996; Marks & Lambert, 1998; Simon, 2002). The relationship between marriage and health is also robust to controls for several characteristics related to both marriage and health. These include age, a strong predictor of marriage that is negatively associated with physical health and may be either positively or negatively associated with mental health (e.g., Charles, Reynolds, & Gatz, 2001); education, an important correlate of both marriage (Goldstein & Kenney, 2001) and a range of health outcomes including longevity, self-reported health, and depression (e.g., Ross & Wu, 1995); parenthood, a status that is closely related to marriage and has also been linked to mental health (Helbig, Lampert, Klose, & Jacobi, 2006; Waite & Gallagher, 2000); and urban–rural residence, a proxy for family and social background that may be particularly important in highly urbanized settings like Japan (Raymo, 2003).

Gender Context and the Relationship Between Marriage and Women's Health

Although empirical evidence from recent studies of the United States and other Western countries consistently points to the health benefits of marriage, the generalizability of these findings to more gender-inegalitarian societies is not clear. The fact that the hypothesized negative effect of marriage on women's health derives from theoretical emphases on the patriarchal nature of marriage and the social isolation of housewives (e.g., Bernard, 1972/1982; Gove & Tudor, 1973) makes this an obvious and important gap in our understanding. The view of marriage as an institution detrimental to women's health has featured prominently in the development of family research. This is particularly true of feminist scholarship, in which marriage has long been viewed as an institution that preserves male dominance and female subordination and the gendered structures of marriage are thought to be detrimental to women's health (Ferree, 2010). In a similar vein, some scholars have argued that changes in men's and women's roles within the family have not kept pace with fundamental restructuring of women's roles outside the family and view the "second

shift” resulting from this mismatch as a source of physical and psychological stressors for married women (Hochschild & Machung, 1989).

However, we should also note that scholarship on marriage and health offers several reasons to expect substantial health benefits of marriage for women in relatively gender-inegalitarian settings. First, because the aforementioned sources of better health in marriage (e.g., economic resources, social and/or emotional support from one’s spouse) are theoretically linked to the institutionalized nature of marriage (Cherlin, 2004; Waite, 1995), their influence may be more pronounced in settings where marriage is more strongly institutionalized. Second, married women may have better health than unmarried women in gender-inegalitarian societies where the roles of housewife and mother are highly valued, family alternatives to marriage are few, and women’s career opportunities are limited. The ideology of marriage and family can contribute to stereotyping, prejudice, and discrimination against unmarried women (and men) even in relatively gender-egalitarian societies like the United States (DePaulo & Morris, 2005). If this kind of stigmatization and negative stereotyping of unmarried women is stronger in gender-inegalitarian societies where deviation from the cultural norms and expectations of marriage is more visible, then the negative health implications for unmarried women may result in a relative health advantage for married women. Furthermore, emphases on gender inequality as a product of multi-institutional relationships across families, states, and markets (Ferree, 2010) suggest that the lower rates of labor force participation among married women in inequalitarian societies may also protect their health by eliminating or reducing the discrimination and stress faced in the workplace. Similarly, reduced employment among married women may limit the health impact of the second shift in settings where women continue to perform nearly all domestic work.

Marriage and Women’s Health in Japan

Contemporary Japan is a gender-inegalitarian society characterized by many of the features just referenced in our description of the two alternative hypotheses regarding marriage and health. First, the idea that marriage is a patriarchal institution harmful to women’s health provides a compelling theoretical rationale for expecting “the onerous status of the Japanese wife and mother” (Tsuya & Mason, 1995, p. 156) to negatively affect the mental and physical health of married women. Despite rapid improvements in women’s educational attainment and high rates of labor force participation before marriage, the large majority of women in Japan continue to exit the labor force prior marriage or childbirth to focus on domestic responsibilities (Brinton, 2001; Yu, 2009). The proportion of married women returning to work after taking parental leave has increased in recent years, but the proportion that remains employed following first birth is only .25, a figure that has not changed since the mid-1980s (National Institute of Population and Social Security Research, NIPSSR, 2007b). This pattern of discontinuous employment reflects the difficulty of combining work and family in a setting where women’s career opportunities are limited, men’s participation in domestic work is minimal (Tsuya, Bumpass, Choe, & Rindfuss, 2005), and flexible day-care options are in short supply (Wada, 2007). It also reflects strong normative expectations for a woman to be a “good wife and wise mother” (*ry sai kenbo*) and to support her husband’s career success (*naijo no k*). The patriarchal nature of Japanese marriage and the

significant changes in women's employment accompanying marriage closely resemble the core elements of theoretical expectations that marriage is bad for women's health (Bernard, 1972/1982). Evidence that husbands' time spent on housework and child care is not sensitive to wives' employment status and work hours (Tsuya et al., 2005) also suggests that the burdens of the second shift may be substantial for married women who do work in Japan.

At the same, however, alternative theories and empirical evidence predict a positive relationship between marriage and women's health in Japan. The institution of marriage remains strong and family alternatives to marriage are limited, which suggests that Japan is a setting in which the institutionalized benefits of marriage may contribute to better health. Marriage has been nearly universal until very recently, and rates of nonmarital childbearing and cohabitation are relatively low compared to the United States and most other Western societies (Raymo, Iwasawa, & Bumpass, 2009). To be sure, marital attitudes and behavior are changing markedly in Japan, with substantial decline across birth cohorts in the perceived importance of marriage (Atoh, 2001) and pronounced increase in age at first marriage (NIPSSR, 2014). However, it is important to recognize that there is little evidence of change in the desire for marriage, and there is even some evidence of an increase in the perceived value of marriage during the recent economic downturn. Attitudinal survey data show that the proportion of unmarried women who (a) stated that they intend to marry at some point ranged from .96 in 1982 to .94 in 2005, (b) agreed that remaining single is not a desirable life course ranged from .58 in 1992 to .56 in 2005, and (c) considered economic comfort as a benefit of marriage increased from .07 in 1992 to .12 in 2005 (NIPSSR, 2007a). In these circumstances, the social pressures and stress associated with not following a "normative" family life course may compromise the health of unmarried women (DePaulo & Morris, 2005). Ethnographic evidence that women who remain single beyond prime marriage ages are often viewed as "odd" or having problems (Ogasawara, 1998) is consistent with such a scenario.

The continued strength of marriage as an institution is also found in a range of structural and normative practices that encourage women's economic dependence and protect housewives. For instance, tax benefits for nonworking or low-earning housewives (e.g., part-time workers) and employer-provided "spousal allowances" for dependent housewives exemplify the structural and normative protections of women's domestic roles (Nagase, 2003) and reflect the high societal valuation of housewives and mothers' roles in children's academic success (Hirao, 2001). To the extent that women internalize these norms regarding domestic roles, marriage could promote health by providing meaning and purpose in life via engagement in multiple social roles (e.g., House et al., 1988). Access to husbands' income may also enhance women's health in light of the persistent gender wage gap and limited career opportunities for women (especially those without a college degree) (Edwards, 1988; Nagase, 2003). Patterns of labor force participation across the life course further suggest that work-related stress is another potentially relevant source of health disparities between unmarried and married women in Japan. Long commutes and work hours, in conjunction with expectations of overtime and socialization outside regular work hours, may also be significant stressors for female workers in Japan (Choe, Bumpas, & Tsuya, 2004; Edwards, 1988). In addition, Japan's long economic slump, which began in 1990, has been characterized by a rapid rise in nonstandard employment, with the proportion of female

employees in nonstandard work (e.g., part-time, dispatch, short-term contract) increasing from .35 in 1988 to .54 in 2010 (Statistics Japan, 2014). The potentially negative health implications of low-paying, nonstandard jobs with no benefits and limited opportunities for advancement may result in a health advantage for married women who are much less likely to be employed.

In sum, existing theories and empirical evidence lead to two alternative hypotheses for the relationship between marriage and women's health in Japan. On the one hand, as earlier scholars have posited, we should observe a negative association between marriage and health if the patriarchal nature of marriage is harmful for women's health. Because Bernard's (1972/1982) primary focus was on mental health, we expect any supportive evidence to be more pronounced for measures of mental health (relative to physical health measures). Also, if changes in employment and lifestyle (and the associated social isolation of housewives) are mechanisms through which patriarchal or gender-inegalitarian marriage harm women's health (Bernard, 1972/1982), then the posited negative relationship between marriage and health should be explained by married women's lower labor force participation (i.e., being a housewife). Emphases on the burden of the second shift (Hochschild & Machung, 1989) also suggest that measures of time spent on both paid employment and domestic work should help explain lower levels of health among married women who are employed. On the other hand, if the institutional benefits of marriage are more pronounced in gender-inegalitarian settings like Japan, we should observe that marriage is beneficial for women's health. Access to husband's economic resources may be particularly salient given that women's economic opportunities are limited and the gender pay gap is large.

Unfortunately, only a few studies have examined relationships between marriage and women's health in Japan, and the results of those studies are ambiguous. Analyses of cross-sectional data show that married women report better mental health than unmarried women (Inaba et al., 2005). But earlier research demonstrating strong positive health selection into marriage raises concerns about the interpretation of this finding (e.g., Goldman, Takahashi, & Hu, 1995). Continued reliance on cross-sectional data and the lack of recent research on health-related selection into marriage leaves us with little basis for evaluating the aforementioned hypotheses. We address these limitations by analyzing recent longitudinal data in ways that explicitly account for the potential endogeneity of marriage and health.

Method

Data

We use data from the Japanese Panel Survey of Consumers (JPSC), an annual survey of a nationally representative sample of young women. The original sample consisted of 1,002 married women and 498 unmarried women (including 42 who were divorced or widowed) aged 24–34 at the first wave in 1993. At Wave 5 (1997), a second cohort consisting of 201 married and 299 unmarried women aged 24–27 was added. Because questions about health were asked every other year beginning in the second wave (1994), and because one set of models includes lagged measures of health, we based our analyses on data from Waves 4–10 (i.e., 1996i.e., 1998i.e., 2000i.e., 2002). Data from the 1994 survey were used only for

lagged indicators of health—health observed in 1994 (i.e., Year $t-2$) served as baseline health for 1996 (i.e., Year t).

These data are representative of women in two specific cohorts who remained in the survey from 1993 to 2002 (Cohort 1) or from 1997 to 2002 (Cohort 2) (Institute for Research on Household Economics, 2003). Retention rates have been consistently high (approximately 95%), and in our sample, 84% of both cohorts remained in the sample through the 10th wave in 2002. Life events such as marriage and residential moves appear to be associated with attrition, and women with lower levels of income are more likely to be lost to follow-up (Sakamoto, 2006). Auxiliary analyses (not presented) indicate that women who were married at the initial wave (1993 or 1997) are more likely to remain in the survey, but health at initial observation was not systematically associated with panel attrition. Results should be evaluated with this information in mind.

The prevalence of missing data ranges from 0.02% for birth between survey waves to 9.07% for income from other household members. We used the ICE (imputation by chained equations) routine in Stata (Royston, 2007) to impute missing values for all variables other than the dependent variables and marital status. The analytical sample size after imputing five complete data sets was 4,974 person-years of observation per data set for models of mental health (from 1,610 individual women) and 3,709 for models of physical health (from 1,604 individual women). The sample size used in models for physical health is smaller than that for mental health because questions about physical health symptoms were not asked in Wave 10 (2002). Results are substantively similar whether we use multiple imputation or listwise deletion (tables available upon request).

Measures

We constructed two health indexes from a battery of 58 questions about various mental and physical health symptoms experienced during the past six months, each of which had response options of yes (1) or no (0). We concatenated this information by using factor analysis to generate two separate health indexes. The first index, consisting of 12 items, includes indicators of mental health symptoms such as depression and anxiety ($\alpha = 0.75$). The second index comprised 13 items reflecting physical health symptoms such as joint pains, headache, and fatigue ($\alpha = 0.75$) (see the Appendix for a list of component questions). Many of these self-reported symptoms are comparable to those included in widely used indexes such as the Center for Epidemiological Studies Depression (CES-D) Scale (Radloff, 1977), the Text Anxiety Inventory (Spielberger, 1980), and the Medical Outcomes Short Form Health Survey (SF-36) (Ware & Sherbourne, 1992). Such self-assessments of health conditions are highly correlated with a range of objective health indicators, including longevity, blood pressure, and disability (e.g., Ferraro & Farmer, 1999; Idler & Benyamini, 1997), and they also provide valuable information reflecting individuals' holistic perceptions of health and judgments about the severity of current illnesses and capture diseases in preclinical or prodromal stages (Idler & Benyamini, 1997).

Because responses were missing for some of the health items, we calculated each index as the mean value of all valid responses. For ease of interpretation, we have coded all component items so that higher values correspond to better health (i.e., 0 = *symptom not*

reported, $-1 = \text{symptom reported}$). The two indexes, ranging from -1 to 0 , reflect the proportion of mental or physical health symptoms that respondents reported. Mean values of -0.27 for the mental health index and -0.39 for the physical health index indicate that, on average, women reported having 27% of the mental health symptoms and 39% of the physical health symptoms (Table 1). The use of these two dimensions of health is valuable in light of evidence that physical health and mental health are often closely related (e.g., Ross et al., 1990) and that interrelationships of gender, health, and marriage may differ depending on the dimension of health considered (Marks & Lambert, 1998; Simon, 2002). A limitation of these measures is that they are self-reported at relatively long (two-year) intervals and thus presumably measured with error. Measurement error in the dependent variable results in larger standard errors for estimated coefficients, which means that our results are a conservative assessment of relationships between marriage and health.

Considering evidence that health and well-being tend to improve immediately following marriage (Soons, Liefbroer, & Kalmijn, 2009; Zimmermann & Easterlin, 2006), our measure of marital status distinguishes newlyweds (women who married between Years $t-2$ and t), those who stayed married across waves, and those who remained never married. Divorced and remarried women were excluded from the analysis because of the relatively small number of divorces (4.1% of person-years) and remarriages (0.2% of person-years) in the data.

Two posited mediators of the marriage–health relationship are employment status and the burden of combining work and family. Employment status was operationalized as a categorical measure that includes nonemployed housewives, full-time, regular employment, and part-time, nonstandard employment. We measured the burden of the second shift as the total number of hours women spent each week on paid work (including commuting time) and housework (including child care), standardized to have a mean of 0 and a standard deviation of 1.

Economic resources, another posited mediator, were measured as per capita income (i.e., half of total couple income for married women and own income for unmarried women). This measure includes income from employment, business, assets, and public transfers and is expressed in units of 100,000 yen (approximately US\$1,000 at prevailing exchange rates) before conversion to the natural log scale. We used combined couple income rather than respondent's and/or husband's own income in light of theoretical emphases on the role of couple-level economic resources in generating the health benefits of marriage (Waite, 1995; Wood et al., 2007). It is also difficult, as a practical matter, to assess the role of individual income given that husband's income is 0 for unmarried women (by definition) and that most full-time housewives do not have any income of their own.

We also included additional variables that have been linked to both marital status and health (Inaba et al., 2005; Ross & Wu, 1995) and have been addressed in critiques of earlier studies (Liu & Umberson, 2008; Waite & Gallagher, 2000). A linear measure of women's age was included to account for age-related change in health, and for ease of interpretation, we rescaled this measure so that the youngest observed age (24) is equal to 0. Educational attainment classified women's highest level of completed schooling into three categories:

high school or less, junior college or vocational school, and university or higher. Parenthood was measured with a categorical indicator of the number of children (0, 1, 2 or more) and a 0–1 indicator of interwave childbirth. Because women may receive additional economic resources from coresiding family members, we also included a measure of other household members' income (converted to the natural log scale after expressing in units of 100,000 yen). Place of residence distinguished women living in large metropolitan areas from those living in smaller cities and towns or villages. All variables are time-varying measures observed at two-year intervals, with the exception of educational attainment, which is time invariant.

Analytic Strategy

Recognizing the potential role of health selection into marriage (Wood et al., 2007), we estimated three different model specifications based on different assumptions about selection. First, we estimated pooled cross-sectional models of health as a function of marital status, an approach that is similar to early studies on marriage and health (e.g., Bernard, 1972/1982; Gove & Tudor, 1973). We then estimated ordinary least squares (OLS) models that include lagged measures of health in an attempt to account for the endogeneity of marriage and health (Horwitz et al., 1996; Simon, 2002). Finally, in a further effort to deal with endogeneity and potential omitted variable bias, we used multiple observations on individual women to estimate fixed-effects models that control for time-invariant unobservable characteristics (e.g., Musick & Bumpass, 2012). If selection, on either observable or unobservable characteristics, contributes to the observed health (dis)advantages of marriage, then controlling for such factors should attenuate or eliminate health differences by marital status observed in the simple, pooled OLS models.

For each of the three analytical strategies, we estimated four models to evaluate the two posited links between marriage and women's health described earlier. The first model estimates the bivariate relationship between marital status and health, net of age. For the lagged dependent variable model, health assessed in the previous survey (Year $t-2$) is also included as a regressor. The second model adds wives' employment type and total hours spent on employment and housework to evaluate whether stressors associated with the role of housewife or the second shift contribute to the relationship between marriage and health observed in Model 1. The third model examines whether the association between marriage and health observed in the first model changes with the inclusion of per capita income, a proxy for economic resources associated with marriage. The final model includes these posited mediators and control variables to examine whether the marriage–health relationship observed in the previous models is due to differences in compositional characteristics across marital categories (Waite & Gallagher, 2000). When interpreting results, it is important to note that we are comparing patterns of relationships (not coefficients) across the different modeling strategies.

Results

Table 1 presents descriptive statistics for all variables in our analyses, for the entire sample and separately by marital status. As noted earlier, we constructed the two health indexes to

range from -1 to 0 , with higher values indicating better health. Married women, regardless of marital duration, have higher values than never-married women on both health indexes ($p < 0.01$). Also, newlyweds reported slightly better mental and physical health than those who have been married longer, consistent with a so-called honeymoon effect (Soons et al., 2009; Zimmermann & Easterlin, 2006). Higher values on both baseline health indexes (measured at Year $t-2$) for continuously married women are suggestive of positive health selection into marriage.

Because continuously married women are older, on average, than unmarried women and because physical health declines with age, simple bivariate comparisons of the two groups will understate any health benefits of marriage. Controlling for age in our multivariate models allows us to compare married and unmarried women of similar age. It is also possible that marital duration (mean duration is 10.23 years in our sample) may be related to health selectivity into marriage to the extent that longer marriages systematically overrepresent healthier women (net of other characteristics). However, supplementary analyses indicated that, net of age, marital duration is not significantly associated with either physical or mental health.

Table 1 also reveals several other differences by marital status. While 90% of unmarried women are working, only about half of married women are employed. Furthermore, the majority of never-married women are employed in regular, full-time jobs, but the proportion of women in this type of employment declines with marital duration. The number of hours per week spent in employment, housework, and child care—a proxy for the burden of the second shift—is higher among married women and increases with marital duration. This pattern implies that married women's time spent on domestic work more than offsets the time they gain from labor force withdrawal or reduced employment. Per capita income is greater for married women than for never-married women, which reflects the contribution of husbands' earnings.

Turning to the control variables, unmarried women and newlyweds tend to have higher education than continuously married women, presumably a reflection of recent trends in educational attainment. Income of other household members is highest among never-married women, which reflects the high prevalence of coresidence with parents before marriage (Raymo & Ono, 2007). The percentages of never-married women living with children (1%) and having an interwave childbirth ($< 0.001\%$) are very small, which reflects the close link between marriage and childbearing in Japan.

Table 2 presents results from pooled cross-sectional OLS models of health as a function of marital status without considering health-related selection into marriage. Standard errors (in parentheses) were adjusted to account for the nonindependence of repeated observations from the same women. Results from Model 1, which includes only age and marital status, indicate that marriage, regardless of duration, is positively associated with both mental and physical health. Age is negatively associated with physical health, but is not related to mental health.

In the next model, we examine whether differences in employment type and total hours spent in employment and domestic work can explain the evidence of better health among married women in the baseline model. Results show that women in part-time work report more mental health symptoms and that both full-time and part-time work are negatively associated with women's physical health (relative to nonworking housewives). These results are not consistent with the hypothesis that housewives should report worse (mental) health and that controlling for this relationship should attenuate a negative bivariate relationship between marriage and health (e.g., Bernard, 1972/1982). In contrast, the statistically significant negative coefficients for total hours spent in employment and domestic work, combined with the higher levels of total hours of employment and housework among married women (Table 1), are generally consistent with the second shift hypothesis (Hochschild & Machung, 1989).

Model 3 adds per capita income to evaluate whether enhanced economic well-being helps explain the observed positive relationship between marriage and women's health in Model 1. Per capita income is positively associated with mental health, but the inclusion of this variable does little to attenuate the mental and physical health advantages for married women.

In Model 4 (full model), the positive coefficients for marriage observed for both physical and mental health in the previous models are no longer statistically significant. Supplementary analyses (not shown) indicate that parity and interwave birth are primarily responsible for this change, which suggests that social valuation of the mother role may play a part in explaining better health among married women in Japan. Full tables that include coefficients for all control variables are available as an online supplement.

Because the OLS pooled cross-section models summarized in Table 2 do not consider the role of health selection into marriage, we proceed to the estimation of panel models that control for health measured in the previous survey (i.e., Year $t-2$). Results for Model 1 in Table 3 show that, not surprisingly, lagged measures of health are strongly correlated with corresponding health measures at Year t . One notable difference from Table 2 is that the relative mental health advantage for continuously married women is weaker ($p < 0.10$). Part of married women's health advantage observed in Table 2 thus reflects higher levels of "baseline" health (see Table 1), which could imply positive health selection into marriage and/or the health benefits of marriage already accrued before Year $t-2$.

Adding two posited correlates of the marriage–health relationship—that is, employment type and the burden of the second shift in Model 2 and per capita (couple) income in Model 3—does not alter the physical health advantage for all married women or the mental health advantage of newlyweds compared to unmarried women. Results for the full model (Model 4) are similar to those for the corresponding model in Table 2—differences in physical and mental health by marital status are no longer statistically significant. Again, parenthood (parity and interwave childbirth) explains better mental health for newlyweds and better physical health for all married women (supplemental analyses).

Table 4 presents the results of fixed effects models that control for time-constant unobserved individual characteristics (and couple characteristics for continuously married women) that might be related to both marital status and health (e.g., personality, preexisting health conditions not captured in our measures of lagged health). Results for the baseline models show that marriage, regardless of duration, is positively associated with both mental and physical health, as in the simple cross-sectional OLS models (Model 1, Table 2).

Model 2 shows that full-time work is negatively associated with both mental and physical health, but part-time work is not associated with either outcome. Total hours spent on employment and domestic work are associated with more mental health symptoms but are unrelated to physical health. In addition, after controlling for these two variables, the mental and physical health advantage for newlyweds observed in Model 1 disappears.

Supplementary analyses (not shown) indicate that newlyweds have better health than never-married women because they are less likely to be employed and more likely to work part-time if they are employed (see Table 1). However, employment status and time use do not explain the health advantages of women who are continuously married across survey waves.

Results of Model 3 indicate that per capita (couple) income is not significantly associated with either of the health indexes and that the mental and physical health advantages of all married women observed in Model 1 are unchanged. Results for the full model (Model 4) show that continuously married women report better mental and physical health than never-married women, but the health of newlyweds is no different than that of their unmarried counterparts. As noted earlier, the insignificant difference between newlyweds and never-married women in Model 4 is primarily a reflection of the health benefits of lower labor force participation among newlyweds (Model 2, Table 4). Most important, the comparison of results from Model 4 in Table 4 (the fixed-effects models) with the corresponding models in Tables 2 (pooled cross-sectional analysis) and 3 (models controlling for lagged health) shows that better health for continuously married women remains statistically significant after we control for time-invariant unobserved characteristics. This finding suggests the presence of unobserved, time-invariant characteristics that are detrimental to the health of continuously married women, possibly including personality and unmeasured health characteristics. Once we account for these factors, marriages of three or more years are associated with better mental and physical health (relative to unmarried women).

Discussion

Our goal in this study has been to shed new light on the relationship between marriage and women's health in a gender-inegalitarian setting by focusing on marriages in contemporary Japan. To account for health-related selection into marriage, we used longitudinal data to compare results across three different model specifications: pooled cross-sectional models, models that control for lagged health, and fixed-effects models that control for unobserved, time-constant characteristics. These models allowed us to examine the extent to which observed differences in health by marital status reflect the role of housewife, the burden of the second shift, and access to husbands' economic resources—three explanations considered in several previous studies (Bernard, 1972/1982; Hochschild & Machung, 1989; Waite, 1995; Wood et al., 2007).

Our results are consistent with the large body of empirical evidence demonstrating a positive relationship between marriage and women's health in the United States and other relatively gender-egalitarian societies. We do find some evidence of positive health selection into marriage, but our results consistently show that marriage is associated with better mental and physical health among women in Japan across the three sets of models. The positive relationship between marriage and Japanese women's health is partly explained by employment status and the burden of work and family responsibilities. Specifically, women's employment—especially full-time employment—is negatively associated with both mental and physical health. Lower levels of labor force participation thus result in better physical and mental health of newlyweds who are less likely than unmarried women to be engaged in full-time, regular employment (Table 4). The better health of married women compared to unmarried women is also consistent with the notion that stressors and normative pressures faced by unmarried women are strong in Japan (e.g., DePaulo & Morris, 2005). It is therefore plausible that the negative health implications of the housewife role posited by earlier scholars are outweighed by the benefits of marriage (e.g., cultural valuation, spousal support) in Japan and perhaps in other relatively gender-inegalitarian societies where the institution of marriage is strong and alternatives to marriage are limited.

In addition, a positive relationship between marriage and women's health in models that account for observed as well as unobserved differences between married and unmarried women suggests that data limitations and the less refined analytical tools available to earlier scholars may have resulted in an underestimation of the health benefits of marriage, as argued in subsequent studies (Wood et al., 2007; Waite & Gallagher, 2000). Our evidence of the negative health implications of employment and the second shift also suggests that earlier emphases on the negative mental health implications of the “isolated housewife” in an “isolated nuclear family” (Bernard, 1972/1982; Gove & Tudor, 1973) may have exaggerated the stressors associated with women's domestic roles and underestimated the stressors faced by unmarried women.

We conclude by suggesting several ways in which future research can extend and improve on this study. First, the data available to us necessitated a focus on women, thus precluding any evaluation of the extent to which “his marriage” may be better than “her marriage.” Although it is clear that marriage is beneficial for the health of men in the United States, our understanding of the direction and magnitude of relationships between relatively gender-inegalitarian marriages and men's health is minimal. Second, it is also important for future research to examine how divorce and remarriage affect women's health in gender-inegalitarian contexts in which the institutional and economic benefits of marriage are strong and divorce and single motherhood continue to be stigmatized. Third, our findings obviously do not imply that all marriages are good for women's health and it is likely that relationship quality moderates the link between marriage and women's health outcomes (Williams, 2003). We did not address this possibility, because it was not our primary focus and because questions about marital quality and health symptoms were not included in the same survey waves. Nevertheless, examining whether the relationship between marriage and women's health depends on marital quality in more gender-inegalitarian settings would represent an important extension of the present study. Finally, the fact that our measures of health are self-assessed at relatively long intervals makes them vulnerable to temporal fluctuation and

reporting biases. For example, stigmatization of mental health problems may result in underreporting of symptoms included in our mental health index, but we are not aware of any theoretical or empirical evidence that this kind of social desirability bias should differ systematically with respect to marital status. Although few social surveys in Japan include diagnostic health data or data collected by health professionals, future studies using objective health indicators or biomarkers to examine health differences by marital status would be a valuable addition to the literature.

Despite these limitations, our application of appropriate analytical methods to panel data in a setting characterized by relatively gender-inegalitarian marriages provides a rigorous evaluation of the association between gender-inegalitarian marriage and women's health. Study findings contribute to our understanding of the ways in which the institution of marriage affects women's well-being in various contexts and the extent to which the health benefits of marriage documented in recent work on the United States are broadly generalizable. Subsequent research on other countries characterized by relatively inegalitarian marriage (e.g., East Asia, Southern Europe) will provide additional evidence with which to further develop this understanding of linkages between marriage and health and the ways they are shaped by context.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

We thank Brian Goseling, Myra M. Ferree, and Larry Bumpass for their comments and suggestions. Research was conducted at the Center for Demography and Ecology and the Center for Demography of Health and Aging at the University of Wisconsin-Madison, which are supported by Center Grants from the National Institute of Child Health and Human Development (R24 HD047873) and the National Institute on Aging (P30 AG17266).

Appendix. Questions Used to Construct the Health Indexes

Index 1: Mental Health
1. You found it difficult to make decisions about trivial matters.
2. You found it difficult to feel either happy or sad.
3. You felt irritated and anxious.
4. You felt that you would be better off dead.
5. You felt sad when you woke up in the morning.
6. You worried about the future.
7. You worried that people did not like you.
8. You felt that people were staring at you.
9. You felt short of breath or nauseous when faced with something unpleasant.
10. You worried that the people around you could read your thoughts.
11. You worried that people were spreading rumors or speaking ill of you.
12. You felt emotional stress.
1. You felt dizzy.

Index 1: Mental Health

2. Your eyes tired easily.
3. You had stomach pains when hungry.
4. You felt pain in your joints.
5. You had back pain.
6. You had heart palpitations.
7. You felt tired when you woke up in the morning.
8. You had a puffy or swollen face.
9. You had difficulty urinating.
10. You had headaches.
11. You caught colds easily.
12. You had a slight fever.
13. You had swollen feet.

Note. Health indexes were constructed from a battery of 58 questions about various dimensions of psychological and physical health. Respondents were asked, “Did you experience the following during the past six months?” with response options of yes (1) or no (0).

References

- Atoh M. 2001; Very low fertility in Japan and value change hypotheses. *Review of Population and Social Security Policy*. 10:1–21.
- Bernard, J. *The future of marriage*. New Haven, CT: Yale University Press; 1982. (Originally published 1972)
- Brinton, MC. Married women’s labor in East Asian economies. In: Brinton, MC, editor *Women’s working lives in East Asia*. Stanford, CA: Stanford University Press; 2001. 1–37.
- Bruce ML, Leaf PJ. 1989; Psychiatric disorders and 15-month mortality in a community sample of older adults. *American Journal of Public Health*. 79:727–730. DOI: 10.2105/AJPH.79.6.727 [PubMed: 2786347]
- Burton RPD. 1998; Global integrative meaning as a mediating factor in the relationship between social roles and psychological distress. *Journal of Health and Social Behavior*. 39:201–215. DOI: 10.2307/2676313 [PubMed: 9785694]
- Carr D, Springer KW. 2010; Advances in families and health research in the 21st century. *Journal of Marriage and the Family*. 72:743–761. DOI: 10.1111/j.1741-3737.2010.00728.x
- Charles ST, Reynolds CA, Gatz M. 2001; Age-related differences and change in positive and negative affect over 23 years. *Journal of Personality and Social Psychology*. 80:136–151. DOI: 10.1037/0022-3514.80.1.136 [PubMed: 11195886]
- Cherlin AJ. 2004; The deinstitutionalization of American marriage. *Journal of Marriage and Family*. 66:848–861. DOI: 10.1111/j.0022-2445.2004.00058.x
- Choe, MK, Bumpass, LL, Tsuya, NO. *Employment*. In: Tsuya, NO, Bumpass, LL, editors *Marriage, work & family life in comparative perspective*. Honolulu: University of Hawaii Press; 2004. 95–113.
- DePaulo BM, Morris WL. 2005; Singles in society and in science. *Psychological Inquiry*. 16:57–83. DOI: 10.1080/1047840X.2005.9682918
- Edwards L. 1988; Equal employment opportunity in Japan: A view from the west. *Industrial and Labor Relations Review*. 41:240–250. DOI: 10.2307/2523634
- Ferraro KF, Farmer MM. 1999; Utility of health data from social surveys: Is there a gold standard for measuring morbidity? *American Sociological Review*. 64:303–315. DOI: 10.2307/2657534
- Ferree MM. 2010; Filling the glass: Gender perspectives on families. *Journal of Marriage and Family*. 72:420–439. DOI: 10.1111/j.1741-3737.2010.00711.x

- Goldman N, Takahashi S, Hu Y. 1995; Mortality among Japanese singles: A re-investigation. *Population Studies*. 49:227–239. DOI: 10.1080/0032472031000148486
- Goldstein JA, Kenney CT. 2001; Marriage delayed or marriage foregone? New cohort forecasts of first marriage for U.S. women. *American Sociological Review*. 66:506–519. DOI: 10.2307/3088920
- Gove WR, Tudor JF. 1973; Adult sex roles and mental illness. *American Journal of Sociology*. 78:812–835. DOI: 10.1086/225404
- Helbig S, Lampert T, Klose M, Jacobi F. 2006; Is parenthood associated with mental health? *Social Psychiatry and Psychiatric Epidemiology*. 41:889–896. DOI: 10.1007/s00127-006-0113-8 [PubMed: 16951919]
- Hirao, K. Mothers as the best teachers: Japanese motherhood and early childhood education. In: Brinton, MC, editor *Women's working lives in East Asia*. Stanford, CA: Stanford University Press; 2001. 180–203.
- Hochschild, AR, Machung, A. *The second shift: Working parents and the revolution at home*. New York, NY: Viking; 1989.
- Horwitz AV, White HR, Howell-White S. 1996; Becoming married and mental health: A longitudinal study of a cohort of young adults. *Journal of Marriage and the Family*. 58:895–907. DOI: 10.2307/353978
- House JS, Umberson D, Landis KR. 1988; Structure and processes of social support. *Annual Review of Sociology*. 14:293–318. DOI: 10.1146/annurev.so.14.080188.001453.
- Idler EL, Benyamini Y. 1997; Self-rated health and mortality: A review of twenty-seven community studies. *Journal of Health and Social Behavior*. 38:21–37. DOI: 10.2307/2955359 [PubMed: 9097506]
- Inaba A, Thoits PA, Ueno K, Gove WR, Evenson RJ, Sloan M. 2005; Depression in the United States and Japan: Gender, marital status, and SES patterns. *Social Science & Medicine*. 61:2280–2292. DOI: 10.1016/j.socscimed.2005.07.014 [PubMed: 16115712]
- Institute for Research on Household Economics. *Women's finances, employment, and lifestyle: Report on the Japan Panel Survey of Consumers [Japanese]*. Tokyo, Japan: Institute for Research on Household Economics; 2003.
- Kaplan RM, Kronick RG. 2006; Marital status and longevity in the United States population. *Journal of Epidemiology and Community Health*. 60:760–765. [PubMed: 16905719]
- Liu H, Umberson DJ. 2008; The times they are a changin': Marital status and health differentials from 1972 to 2003. *Journal of Health and Social Behavior*. 49:239–253. DOI: 10.1177/002214650804900301 [PubMed: 18771061]
- Manzoli L, Villari P, Pirone GM, Boccia A. 2007; Marital status and mortality in the elderly: A systematic review and meta-analysis. *Social Science & Medicine*. 64:77–94. DOI: 10.1016/j.socscimed.2006.08.031 [PubMed: 17011690]
- Marks NF, Lambert JD. 1998; Marital status continuity and change among young and midlife adults: Longitudinal effects on psychological well-being. *Journal of Family Issues*. 19:652–686. DOI: 10.1177/019251398019006001
- Murray JE. 2000; Marital protection and marital selection: Evidence from a historical-prospective sample of American men. *Demography*. 37:511–521. [PubMed: 11086576]
- Musick K, Bumpass LL. 2012; Reexamining the case for marriage: Union formation and changes in well-being. *Journal of Marriage and Family*. 74:1–18. DOI: 10.1111/j.1741-3737.2011.00873.x [PubMed: 22611285]
- Nagase, N. Standard and nonstandard work arrangements, pay differences, and choice of work by Japanese mothers. In: Houseman, SN, Iwasa, M, editors *Nonstandard work in developed economies: Causes and consequences*. Kalamazoo, MI: W. E. Upjohn Institute for Employment Research; 2003. 267–300.
- National Institute of Population and Social Security Research. *Attitudes toward marriage and the family among the unmarried Japanese youth: The thirteenth National Fertility Survey [Japanese]*. Tokyo, Japan: National Institute of Population and Social Security Research; 2007a.
- National Institute of Population and Social Security Research. *Marriage process and fertility of Japanese married couples: The thirteenth National Fertility Survey [Japanese]*. Tokyo, Japan: National Institute of Population and Social Security Research; 2007b.

- National Institute of Population and Social Security Research. Latest demographic statistics [in Japanese]. Tokyo, Japan: National Institute of Population and Social Security Research; 2014.
- Ogasawara, Y. Office ladies and salaried men. Berkeley, CA: University of California Press; 1998.
- Prigerson HG, Maciejewski PK, Rosenheck RA. 2000; Preliminary explorations of the harmful interactive effects of widowhood and marital harmony on health, health service use, and health care costs. *Gerontologist*. 40:349–357. DOI: 10.1093/geront/40.3.349 [PubMed: 10853529]
- Radloff LS. 1977; The CES-D scale a self-report depression scale for research in the general population. *Applied Psychological Measurement*. 1:385–401. DOI: 10.1177/014662167700100306
- Raymo JM. 2003; Educational attainment and the transition to first marriage among Japanese women. *Demography*. 40:83–103. DOI: 10.1353/dem.2003.0008 [PubMed: 12647515]
- Raymo JM, Iwasawa M, Bumpass L. 2009; Cohabitation and family formation in Japan. *Demography*. 46:785–803. DOI: 10.1353/dem.0.0075 [PubMed: 20084829]
- Raymo JM, Ono H. 2007; Coresidence with parents, women's economic resources, and the transition to marriage in Japan. *Journal of Family Issues*. 28:653–681. DOI: 10.1177/0192513X06298236
- Ross CE, Mirowsky J, Goldsteen K. 1990; The impact of the family on health: The decade in review. *Journal of Marriage and the Family*. 52:1059–1078. DOI: 10.2307/353319
- Ross CE, Wu CH. 1995; The links between education and health. *American Sociological Review*. 60:719–745. DOI: 10.2307/2096319
- Royston P. 2007; Multiple imputation of missing values: Further update of ICE, with an emphasis on interval censoring. *Stata Journal*. 7:445–464.
- Sakamoto K. 2006; Analysis of sample attrition: Using the Japanese Panel Survey of Consumers to evaluate the correlates of attrition and estimation bias. *Japanese Journal of Labour Studies*. (551): 55–70.
- Simon RW. 2002; Revisiting the relationships among gender, marital status, and mental health. *American Journal of Sociology*. 107:1065–1096. DOI: 10.1086/339225
- Soons JPM, Liefbroer AC, Kalmijn M. 2009; The long-term consequences of relationship formation for subjective well-being. *Journal of Marriage and Family*. 71:1254–1270. DOI: 10.1111/j.1741-3737.2009.00667.x
- Spielberger, CD. Test anxiety inventory. Menlo Park, CA: Mind Garden; 1980.
- Statistics Japan. Labour Force Survey: Time series data [Japanese]. 2014. Retrieved from http://www.stat.go.jp/data/roudou/longtime/03roudou.htm#hyo_1
- Tsuya NO, Bumpass LL, Choe MK, Rindfuss RR. 2005; Is the gender division of labour changing in Japan? *Asian Population Studies*. 1:47–67. DOI: 10.1080/17441730500125805
- Tsuya, NO, Mason, KO. Changing gender roles and below-replacement fertility in Japan. In: Mason, KO, Jensen, A-M, editors *Gender and family change in industrialized countries*. New York, NY: Oxford University Press; 1995. 139–167.
- Umberson D. 1992; Gender, marital status, and the social control of health behavior. *Social Science and Medicine*. 34:907–917. DOI: 10.1016/0277-9536(92)90259-S [PubMed: 1604380]
- Wada, J. The political economy of daycare centers in Japan. In: Rosenbluth, FM, editor *The political economy of Japan's low fertility*. Stanford, CA: Stanford University Press; 2007. 155–169.
- Waite LJ. 1995; Does marriage matter? *Demography*. 32:483–507. DOI: 10.2307/2061670 [PubMed: 8925942]
- Waite, LJ, Gallagher, M. The case for marriage: Why married people are happier, healthier, and better off financially. New York, NY: Doubleday; 2000.
- Ware JE Jr, Sherbourne CD. 1992; The MOS 36-item Short-Form Health Survey (SF-36): I. Conceptual Framework and Item Selection. *Medical Care*. 30:473–483. DOI: 10.1097/00005650-199206000-00002 [PubMed: 1593914]
- Weissman M, Roger CB, Canino GJ, Faravelli C, Greenwald S, Hwu H-G, Yeh E-K. 1996; Cross-national epidemiology of major depression and bipolar disorder. *Journal of the American Medical Association*. 276:293–299. DOI: 10.1001/jama.1996.03540040037030 [PubMed: 8656541]
- Williams K. 2003; Has the future of marriage arrived? A contemporary examination of gender, marriage, and psychological well-being. *Journal of Health and Social Behavior*. 44:470–487. DOI: 10.2307/1519794 [PubMed: 15038144]

- Williams K, Umberson D. 2004; Marital status, marital transitions, and health: A gendered life course perspective. *Journal of Health and Social Behavior*. 45:81–98. [PubMed: 15179909]
- Wood, RG; Goesling, B; Avellar, S. The effects of marriage on health: A synthesis of recent research evidence (Report prepared for the U.S Department of Health and Human Services Assistant Secretary for Planning and Evaluation). 2007. Jun 19, Retrieved from <https://aspe.hhs.gov/sites/default/files/pdf/75106/report.pdf>
- World Economic Forum. The global gender gap report 2014. Geneva, Switzerland: Author; 2014.
- Yu, WH. Gendered trajectories: Women, work, and social changes in Japan and Taiwan. Stanford, CA: Stanford University Press; 2009.
- Zimmermann AC, Easterlin RA. 2006; Happily ever after? Cohabitation, marriage, divorce, and happiness in Germany. *Population and Development Review*. 32:511–528. DOI: 10.1111/j.1728-4457.2006.00135.x

Table 1

Sample Characteristic, by Marital Status

Variables	Total		Never Married		Newlyweds		Continuously Married	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Health outcomes								
Mental health	-0.27	0.21	-0.31	0.22	-0.24 [*]	0.20	-0.27 [*]	0.20
Physical health	-0.39	0.30	-0.44	0.30	-0.35 [*]	0.28	-0.38 [*]	0.30
Baseline health: Mental health (Year t-2)	-0.28	0.21	-0.32	0.22	-0.28 [*]	0.20	-0.27 [*]	0.20
Baseline health: physical health (Year t-2)	-0.28	0.21	-0.32	0.21	-0.28 [*]	0.20	-0.27 [*]	0.21
Marital status								
Never married	0.19		1.00		N/A		N/A	
Newlyweds	0.04		N/A		1.00		N/A	
Continuously married	0.77		N/A		N/A		1.00	
Employment status and type								
Not working/Housewife	0.40		0.10		0.48 [*]		0.48 [*]	
Full-time/standard employment	0.26		0.67		0.33 [*]		0.16 [*]	
Part-time/nonstandard employment	0.33		0.24		0.19 [*]		0.36 [*]	
Total hours of employment and housework	66.81	22.25	53.57	16.84	64.48 [*]	26.05	70.20 [*]	21.94
Per capita income (log)	3.34	0.74	3.22	0.87	3.58 [*]	0.79	3.36 [*]	0.70
Age	33.95	4.13	31.51	3.49	30.06 [*]	2.80	34.78 [*]	3.97
Education								
High school or less	0.47		0.36		0.30 [*]		0.51 [*]	
Junior college/vocational school	0.40		0.42		0.48 [*]		0.39 [*]	
University	0.13		0.22		0.22		0.10 [*]	
Income of other household members (log)	1.20	1.71	2.94	1.82	0.32 [*]	0.94	0.82 [*]	1.42
Parity								
0	0.28		0.99		0.67 [*]		0.08 [*]	
1	0.17		0.01		0.33 [*]		0.20 [*]	

Variables	Total		Never Married		Newlyweds		Continuously Married	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
2+	0.55		0.00		0.01		0.72 [*]	
Childbirth (between Year t & t+2)	0.14		0.00		0.34 [*]		0.17 [*]	
Place of residence								
Big cities	0.25		0.37		0.25 [*]		0.21 [*]	
Other cities	0.56		0.52		0.61 [*]		0.57 [*]	
Town/village	0.19		0.11		0.14		0.22 [*]	
Total observations (5 imputed data sets)	24,870		4,695		1,105		19,070	
Observations per data set	4,974		939		221		3,814	

Note: Proportions may not add up to 1 due to rounding error.

^{*} $p < .05$ (two-tailed t-tests comparing values of with those of never married women)

Table 2

Estimated Coefficients From OLS Models

<i>Variables</i>	Mental Health (N = 4,974)							
	Model 1		Model 2		Model 3		Model 4	
	B	SE	B	SE	B	SE	B	SE
Age	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Marital status								
Never married (omitted)								
Newlyweds	0.07**	0.02	0.07**	0.02	0.06**	0.02	0.03	0.02
Continuously married	0.04**	0.01	0.04**	0.02	0.04**	0.01	0.02	0.02
Employment status and type								
Housewife (omitted)								
Full-time employment			-0.01	0.01			-0.02	0.01
Part-time employment			-0.02*	0.01			-0.02	0.01
Total hours (employment & housework)			-0.01*	0.01			-0.02**	0.01
Per capita income (log)					0.02**	0.01	0.03**	0.01
Constant	-0.31**	0.01	-0.31**	0.02	-0.39**	0.02	-0.39**	0.03
<i>F</i>	6.18**		5.80**		8.06**		6.11**	
Adjusted <i>R</i> ²	0.01		0.01		0.01		0.03	
Physical Health (N = 3,709)								
<i>Variables</i>	Model 1		Model 2		Model 3		Model 4	
	B	SE	B	SE	B	SE	B	SE
Age	-0.01**	0.00	-0.01**	0.00	-0.01**	0.00	-0.01**	0.00
Marital status								
Never married (omitted)								
Newlyweds	0.08**	0.02	0.07**	0.03	0.08**	0.02	0.04	0.03
Continuously married	0.07**	0.02	0.06**	0.02	0.07**	0.02	0.01	0.03

Mental Health (<i>N</i> = 4,974)						
	Model 1		Model 2		Model 3	
<i>Variables</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
Employment status and type						
Housewife (omitted)						
Full-time employment			−0.04**	0.02		−0.06** 0.02
Part-time employment			−0.05**	0.01		−0.04** 0.01
Total hours (employment & housework)			−0.01*	0.01		−0.02** 0.01
Per capita income (log)					0.01	0.02** 0.01
Constant	−0.39**	0.02	−0.36**	0.02	−0.42**	0.03
<i>F</i>	11.10**		9.96**		8.38**	6.59**
Adjusted <i>R</i> ²	0.01		0.02		0.01	0.03

Note. Robust standard errors were used. *N* = observations per imputed data set. Model 4 (full model) includes such controls as income of other household members (log), education, parity, childbirth between Year *t* and Year *t* + 2, and place of residence (full tables available as an online supplement).

* $p < .05$.

** $p < .01$.

Table 3

Estimated Coefficients From OLS Models Including Baseline Health

<i>Variables</i>	Mental Health (<i>N</i> = 4,974)							
	Model 1		Model 2		Model 3		Model 4	
	B	SE	B	SE	B	SE	B	SE
Age	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Marital status								
Never married (omitted)								
Newlyweds	0.04**	0.01	0.04**	0.01	0.03**	0.01	0.03	0.01
Continuously married	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Lagged health (Year <i>t</i> –2)	0.67**	0.01	0.67**	0.01	0.67**	0.01	0.66**	0.01
Employment status and type								
Housewife (omitted)								
Full-time employment			–0.01	0.01			–0.01	0.01
Part-time employment			–0.01	0.01			0.00	0.01
Total hours (employment and housework)			–0.01**	0.00			–0.01**	0.00
Per capita income (log)					0.01**	0.00	0.01**	0.00
Constant	–0.10**	0.01	–0.10**	0.01	–0.13**	0.01	–0.14**	0.01
<i>F</i>	640.99**		376.78**		516.35**		172.35**	
Adjusted <i>R</i> ²	0.45		0.45		0.45		0.45	
Physical Health (<i>N</i> = 3,709)								
<i>Variables</i>	Model 1		Model 2		Model 3		Model 4	
	B	SE	B	SE	B	SE	B	SE
Age	–0.01**	0.00	–0.01**	0.00	–0.01**	0.00	–0.01**	0.00
Marital status								
Never married (omitted)								
Newlyweds	0.06**	0.02	0.05*	0.02	0.05**	0.02	0.03	0.02
Continuously married	0.04**	0.01	0.03*	0.01	0.04**	0.01	0.00	0.02

Mental Health (<i>N</i> = 4,974)						
<i>Variables</i>	Model 1		Model 2		Model 3	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
Lagged health (Year <i>t</i> –2)	0.76**	0.02	0.76**	0.02	0.76**	0.02
Employment status and type						
Housewife (omitted)						
Full-time employment			–0.03**	0.01		–0.04**
Part-time employment			–0.04**	0.01		–0.03**
Total hours (employment and housework)			–0.01*	0.00		–0.01**
Per capita income (log)					0.00	0.01*
Constant	–0.15**	0.01	–0.13**	0.02	–0.16**	0.02
<i>F</i>	488.60**		291.69**		386.40**	
Adjusted <i>R</i> ²	0.29		0.30		0.29	

Note. Robust standard errors were used. *N* = observations per imputed data set. Model 4 (full model) includes such controls as income of other household members (log), education, parity, childbirth between Year *t* and Year *t* + 2, and place of residence (full tables available as an online supplement).

* $p < .05$.

** $p < .01$.

Table 4

Estimated Coefficients From Fixed-Effects Models

Variables	Mental Health (N = 4,974)							
	Model 1		Model 2		Model 3		Model 4	
	B	SE	B	SE	B	SE	B	SE
Age	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Marital status								
Never married (omitted)								
Newlyweds	0.04 *	0.02	0.03	0.02	0.04 *	0.02	0.02	0.02
Continuously married	0.06 **	0.02	0.05 *	0.02	0.06 **	0.02	0.06 *	0.02
Employment status and type								
Housewife (omitted)								
Full-time employment			-0.04 **	0.01			-0.04 **	0.01
Part-time employment			-0.02	0.01			-0.01	0.01
Total hours (employment and housework)			-0.01 *	0.00			-0.01	0.00
Per capita income (log)					0.00	0.01	0.00	0.00
Constant	-0.33 **	0.02	-0.30 **	0.02	-0.31 **	0.02	-0.30 **	0.03
F	3.90 **		5.48 **		2.97 *		4.08 **	
σ_u	0.19		0.19		0.19		0.19	
σ_e	0.12		0.12		0.12		0.12	
ρ	0.70		0.70		0.70		0.71	

Variables	Physical Health (N = 3,709)							
	Model 1		Model 2		Model 3		Model 4	
	B	SE	B	SE	B	SE	B	SE
Age	-0.08 **	0.00	-0.08 **	0.00	-0.08 **	0.00	-0.08 **	0.00
Marital status								
Never married (omitted)								
Newlyweds	0.09 **	0.04	0.06	0.04	0.09 **	0.04	0.04	0.04

Mental Health (<i>N</i> = 4,974)								
Variables	Model 1		Model 2		Model 3		Model 4	
	B	SE	B	SE	B	SE	B	SE
Continuously married	0.18**	0.04	0.14**	0.04	0.19**	0.04	0.13*	0.05
Employment status and type								
Housewife (omitted)								
Full-time employment			−0.11**	0.02			−0.11**	0.02
Part-time employment			−0.01	0.02			−0.02	0.02
Total hours (employment and housework)			−0.01	0.01			−0.01	0.01
Per capita income (log)					0.00	0.01	0.00	0.01
Constant	0.17**	0.03	0.24**	0.04	0.18**	0.04	0.23**	0.06
<i>F</i>	365.32**		190.55**		276.21**		88.52**	
<i>sigma_u</i>	0.40		0.41		0.41		0.41	
<i>sigma_e</i>	0.19		0.19		0.19		0.19	
<i>rho</i>	0.82		0.82		0.82		0.82	

Note. Robust standard errors were used. *N*= observations per imputed data set. Model 4 (full model) includes such controls as income of other household members (log), parity, childbirth between Year *t* and Year *t* + 2, and place of residence (full tables available as an online supplement). Rho is fraction of variance due to u_i .

* $p < .05$.

** $p < .01$.