Marital Biography and Health at Mid-Life[*]

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Abstract

This article develops a series of hypotheses about the long-term effects of one's history of marriage, divorce, and widowhood on health, and it tests those hypotheses using data from the Health and Retirement Study. We examine four dimensions of health at mid-life: chronic conditions, mobility limitations, self-rated health, and depressive symptoms. We find that the experience of marital disruption damages health, with the effects still evident years later; among the currently married, those who have ever been divorced show worse health on all dimensions. Both the divorced and widowed who do not remarry show worse health than the currently married on all dimensions. Dimensions of health that seem to develop slowly, such as chronic conditions and mobility limitations, show strong effects of past marital disruption, whereas others, such as depressive symptoms, seem more sensitive to current marital status. Those who spent more years divorced or widowed show more chronic conditions and mobility limitations.

A long tradition of research demonstrates that being married is positively related to health and longevity (Goldman, Korenman, and Weinstein 1995; Lillard and Waite 1995; Umberson 1992). Married adults show better health outcomes than the unmarried across a variety of acute and chronic conditions, including colds, cancer, and heart attacks (Cohen et al. 1997; Goodwin et al. 1987; Gordon and Rosenthal 1995). Married persons are also less likely to die in any given period than the unmarried, although the longevity benefits of marriage are much larger for men than for women (Lillard and Waite 1995; Ross, Mirowsky, and Goldsteen 1990). Married men and women also appear to have better mental health than their unmarried counterparts (Marks and Lambert 1998; Mirowsky and Ross 2003; Umberson et al. 1996; Waite and Hughes 1999; Williams 2003). However, remarriages seem to enhance mental health less than first marriages (Barrett 2000; Marks and Lambert 1998; Williams 2003).

Most research examines health differences by marital status. Fewer studies have examined the effect of *changes* in marital status on either mental or physical well-being. Studies that do examine marital transitions most often link these changes to shifts in mental health. Studies of marital change and mental health find that people who separate or divorce show increases in depressive affect (Marks and Lambert 1998; Simon 2002; Wade and Pevalin 2004). Simon (2002) also finds increases in depressive symptoms among men and women

whose spouse dies, and Wade and Pevalin (2004) find a similar result for a general measure of mental health. In contrast, getting married tends to improve mental health (Horwitz and White 1991; Marks and Lambert 1998; Simon 2002).

The smaller number of articles linking marital transitions and physical health shows that both marital gain and marital loss affect physical health, although the direction and the magnitude of the effect may depend on gender, whether it is a first or later transition, and for marital loss, how the marriage ends. Lillard and Waite (1995) find that both men and women show declines in the hazard of dying when they marry, although these effects appear at marriage for men and cumulate with duration of marriage for women. Men who become unmarried show large increases in the chances of dying, net of other characteristics, regardless of how their marriage ended. For women, the end of a marriage through divorce or separation increases the risk of death, but the death of the husband does not (Hemström 1996). Williams and Umberson (2004) examine the effect of five-year marital stability and change on self-rated health. They find that the continuously unmarried rate their health similarly to the continuously married, and they conclude that observed health differences between the married and the unmarried reflect the strains of dissolution more than the health benefits of marriage.

Despite the many studies linking marriage and health, we know less about the long-term health implications of marital status and marital transitions. Research that does take a long-term view tends to focus on the association between health and particular components of marital biography. For instance, in a broader study of life course effects on health, Grundy and Holt (2000) find that women who married more than once and men who married young (under age 25) report poorer self-rated health and higher levels of disability in old age. Pienta, Hayward, and Jenkins (2000) find that in mid-life, married people have the lowest rates of morbidity for diseases, functional limitations, and disability, but they find no evidence of a simple linear relationship between length of marriage and prevalence of any of these diseases or conditions. And Meadows (2009) finds sizeable and stable advantages in both self-rated health and mental health among married fathers in the Fragile Families Study.

A number of recent studies do consider the health implications of entire marital biographies; however, these tend to focus on a single dimension of health. Dupre and Meadows (2007) examine the relationship between marital histories and the incidence of chronic disease. Their results suggest the importance of *time* spent married; age-related increases in disease are slowed by longer marital durations. Brockmann and Klein (2004) examine the effects of time in marital states on risk of death. They find that the health benefits of marriage accumulate, while the negative health consequences of being single, divorced, or widowed attenuate over time. They find no evidence that these effects differ by marriage order. Zhang and Hayward (2006) assess the relationship between marital history and the prevalence and incidence of cardiovascular diseases at older ages. They find that both men and women who have experienced a marital loss have a higher prevalence of cardiovascular disease and that ever-divorced or widowed women, but not men, show a higher incidence of cardiovascular disease. Duration of marriage is positively related to incidence of cardiovascular disease for both genders, a result that is largely explained by health behaviors and co-morbidities. Barrett (2000) examines the link between marital histories and mental health in a local sample. She finds that currently married persons who were ever divorced or widowed report worse mental health than continuously married persons; persons who are currently divorced or widowed for the second time show worse mental health than those disrupted for the first time.

The available evidence, while suggestive rather than definitive, points to a sizeable and theoretically important effect of accumulated marital history on current health and well-being. In this article, we develop and test a series of hypotheses about the effects of marital biography on four dimensions of health at later ages. We move beyond previous research by considering the health effects of the components of marital biography and by examining multiple dimensions of health. Specifically, we assess the effects of both marital transitions and marital statuses on various dimensions of health, and we compare the impact of these components across health dimensions.

CONCEPTUAL FRAMEWORK

An individual's marital biography is composed of transitions into and out of marriage and durations in particular marital statuses. The occurrence of transitions, their type, and the ages at which they occur determine an individual's duration in each marital status (e.g., never married, married, divorced, widowed, or remarried). For people who have never married, current marital status and marital biography overlap completely. Among those who married once and remained married, marital biographies differ only due to differences in marital duration (i.e., age at marriage).

Marital statuses and marital transitions bring costs and benefits to an individual. The research summarized earlier finds that being married protects or even enhances health and being divorced or widowed damages health. Theoretically, these health effects may vary by duration in state, increasing or diminishing with time. The research literature also links marital transitions to health; in particular, experiencing a marital loss is related to immediate health declines. We suggest that both effects are long lasting and accumulate over time. Thus, we argue, an individual's current health will reflect *both* current marital status and his or her marital biography.

We assume that each person enters adulthood with a particular "stock" of health (O'Rand 2001). A person's stock will reflect both health endowment at birth and health-affecting experiences in the family of origin (Grossman 1972). Each person's experiences of marital gain and loss affect this stock of health. For example, the transition to marriage tends to bring an immediate health benefit in that it improves health behaviors for men and financial well-being for women (Bachman et al. 1997; Hahn 1993). Over time, the health of a married person is protected, or even enhanced, through the pathways described above.

The end of a marriage through divorce extracts an immediate toll on mental and physical health, although the effects might depend on gender, age, and the quality of the marriage (Williams 2003; Williams and Umberson 2004). Prior to a divorce, the health benefits of marriage may have attenuated or become negative as the relationship became strained. Divorce is often stressful, even if desired. But the disrupted state itself may also initiate a period of new, chronic strains (Williams and Umberson 2004). Divorced persons may have to raise children alone or negotiate parenting with an ex-spouse, usually experience lowered incomes, and possibly experience social stigma. All of these outcomes may have long-term negative effects on mental and physical health.

Loss of a spouse to death may also damage health, due to the stress of bereavement, loss of social support and companionship, the difficulties of running a household alone, and declines in income. Widowhood may be preceded by a period of ill health during which the sick spouse is less likely to provide help and support and often require care, which may isolate the caregiver spouse from others (Williams 2004).

Finally, a remarriage once again brings the benefits of marriage. However, some evidence suggests that the health benefits of remarriage are not as large as those that accompany first

marriage (Barrett 2000; Marks and Lambert 1998; Williams and Umberson 2004). The remarried face unique challenges to their relationship, for example the presence of stepchildren, lack of institutionalization of key roles (Cherlin 1978), and possible financial responsibilities to another household.

Thus, theoretically, the observed relationship between marital history and health reflects two distinct types of effect. *Status effects* result from the long-term benefits to or costs of occupying a particular marital state for a particular duration. For example, the literature suggests that the married show better health than the unmarried because the married state brings financial, emotional, and social resources that are less available outside it. *Transition effects* reflect the long-term impact of specific marital transitions. The literature demonstrates the often high costs of marital loss, especially around the time of the transition; however, these costs may also leave a lasting imprint on health. These two effects are not mutually exclusive; the observed relationship between marital biography and health will reflect the balance of the two. However, disentangling the effects is important because they have different theoretical and practical implications.

We expect that the relationship between marital biography and current health will depend on the dimension of health being considered. Chronic diseases develop over long periods of time and are hypothesized to reflect, at least in part, the long-term dysregulation of major physiological systems (McEwen and Stellar 1993). In turn, this dysregulation is hypothesized to reflect the accumulated effects of socially structured experiences of stress and recovery (Singer and Ryff 1999). From this perspective, observed social differentials in chronic health conditions do not simply reflect biological aging and one's current behaviors and circumstances, but one's life history (Hayward et al. 2000). We therefore expect chronic conditions and the disabilities that follow from them to reflect the health imprint of marital biography especially strongly.

In contrast, research finds that current mental health changes relatively quickly in response to marital transitions (Marks and Lambert 1998; Simon 2002). Thus, we expect that differences between those with various marital biographies will be smaller for this dimension of health than on those that change more slowly.

Self-rated health is somewhat more difficult to characterize. It is quite predictive of later mortality, suggesting that it reflects some underlying dimension of health or the trajectory of health the person perceives. Both self-rated health and changes in this measure are affected by negative mood and positive affect and activity, and both seem sensitive to changes in underlying health (Benyamini et al. 2000; Ferraro and Kelley-Moore 2001). Ratings of own health also respond to marital gains and losses, according to Williams and Umberson (2004). This suggests that self assessments of health will reflect both long-term health conditions (reflecting one's marital biography) and one's current health state (reflecting current marital status) and that the observed effect of marital biography on self-rated health will thus fall between chronic conditions and mobility limitations on the one hand and depressive symptoms on the other.

HYPOTHESES

We use a nationally representative sample to assess the relationship between marital biography and physical and mental health at mid-life. Our analysis is designed to test four hypotheses derived from the conceptual framework we developed above. The first three hypotheses concern the distinct effects of marital transitions and durations in marital states on health; the fourth relates to the differential effects of these components of marital biography on various dimensions of health.

First, we test the hypothesis that health in mid-life depends on both current marital status and a person's history of marital transitions. We argue that the observed short-term effects of marital transitions extend to the long run. We thus expect that among persons who are currently married, those who have experienced a prior marital loss will have poorer health than those who have been married continuously.

Second, we test the hypothesis that, among persons who have been continuously married, those who have been married a greater proportion of their lives are in better health. Third, we test the parallel hypothesis that, among people who have been divorced at least once, those who have spent a greater proportion of their lives divorced are in worse health. Together, these tests assess the extent to which durations in marital states affect health conditional on marital transitions.

Fourth, following our conceptual framework, we test the hypothesis that health deficits among persons with a history of marital loss, shorter durations married, or longer durations disrupted are largest for dimensions of health that reflect experiences over a long period, such as chronic conditions and mobility limitations, and smallest for dimensions of health such as depression, which can change relatively quickly in response to marital transitions.

The research literature finds gender differences in the short-term effects of marital status and marital transitions on health, although these vary among health domains. In general, the beneficial effects of marriage on physical health are stronger for men, although recent research points to very similar positive effects of marriage on mental health for both men and women (Marks and Lambert 1998; Simon 2002; Williams 2003). We performed our analyses separately by gender, but we found few gender differences. We therefore present our results for both genders together and report the few statistically significant gender differences that emerged.

DATA AND MEASURES

Data

Our data are drawn from the Health and Retirement Study (HRS), a nationally representative, longitudinal study of persons over age 50. The HRS is composed of several cohorts who entered the study in different calendar years. Eligibility for each cohort was based on birth year, although spouses of age-eligible cohort respondents were interviewed regardless of their age. We use data from age-eligible members of the original cohort who entered the study in 1992. These persons were born between 1931 and 1941 and were ages 51–61 in 1992.

The sample for the original cohort of the HRS was derived from a stratified, multistage area probability design in which blacks, Hispanics, and Floridians were oversampled. Baseline interviews with 9,761 age-eligible respondents were completed in 1992, representing a response rate of 82 percent (Health and Retirement Study 2005). Because our focus is the association between marital biography and current health, we use data from the baseline interview, which contains a marriage history section.

Our analytic sample is based on the 9,104 white, black, and Hispanic age-eligible, non-proxy respondents interviewed in 1992. We exclude the 225 persons who were cohabiting at the time of the interview because they were not asked the full marital history. Of the remaining sample, 227 persons (2.6%) had incomplete or inconsistent marital history information. In most of our analyses, we need only exclude the 70 persons missing information on number and types of marital transitions, resulting in a sample size of 8,809.

In the analysis of marital duration, we must also exclude the 157 persons missing dates of marital transitions, resulting in a sample of 8,652 individuals.

The Health and Retirement Study original cohort is especially useful for an investigation of the link between marital biography and health. The respondents are in late mid-life, so they have accumulated many years of marital biography. However, they are young enough to mitigate any serious sample selection bias due to mortality (but see Hayward et al. 2000 on race differences in probabilities of survival to the ages included in the HRS), although this may also mean the respondents have had less exposure to widowhood. We note that the higher death rates faced by the unmarried relative to the married, cited earlier, mean that the least healthy unmarried persons are underrepresented in our sample, making our estimates of health differentials by marital status somewhat conservative. While most adults in this age group are healthy, a substantial fraction shows signs of health impairment (Waite and Hughes 1999). Since many of these impairments are due to chronic conditions with long latency periods, marital biography may be particularly important to understanding their etiology.

Measures of Marital Biography

The top panel of Table 1 shows the sample distributions of various measures of marital biography. First, we present a standard measure of current marital status, which distinguishes those who are currently married from those who have never been married and from those who have been married but are not currently married. We refer to the latter group as previously married. We also separate the currently married into persons who have been continuously married (married once and remained married) and persons who are remarried (divorced or widowed at least once but currently married). Nearly 20 percent of the sample is remarried, representing 26 percent of the currently married. Almost 22 percent is previously married; of these, 69 percent have been separated or divorced and 31 percent have been widowed. Less than 4 percent of the sample has never married.

In the next panel, we expand the remarried and previously married categories to show the number and types of marital transitions that persons in these categories experienced. We combine those with two divorces with the small number of people who report three or more divorces, since there are too few of the latter to support separate analysis. We also include in this category the very small number of people who experienced both a divorce and widowhood, for similar reasons. Examination of the health of persons with three or more divorces or combination marital histories suggests that such people tend to be disadvantaged compared to those with fewer marital losses, as might be expected if each disruption affects health (results not shown), but the small number of cases means that these conclusions are tentative. The next panels of Table 1 show measures summarizing marital durations: mean age at marriage, mean number of years spent married, and the mean and percentage of years spent disrupted, including all marriages and all spells of disruption. We show these measures separately for the continuously married and for persons who have experienced at least one marital disruption.

Health Measures

We examine health in four dimensions: number of chronic conditions, number of mobility limitations, self-reported health, and symptoms of depression. The distributions of these variables are shown in the bottom panel of Table 1. In all cases, the measures were coded so that higher values indicated worse health.

Number of chronic conditions—Respondents were asked if a doctor had ever told them that they had diabetes, heart disease, lung disease, cancer, hypertension, or a stroke. Our

measure of chronic conditions is the total number of conditions reported; it ranges from 0 to 6.

Number of mobility limitations—This variable directly assesses the respondent's capacity for physical mobility and is thus a measure of physical functioning. It is calculated by counting affirmative responses to five items assessing whether the respondent has difficulty with specific forms of ambulation, such as walking a block and climbing a flight of stairs (Wallace and Herzog 1995).

Self-rated health—Self-rated health is designed to capture respondents' subjective assessment of their own medical and functional status. It has been widely used across studies and correlates well with physician assessments of health and with mortality (Idler and Benyamini 1997). Respondents were asked, "Would you say that your health is excellent, very good, good, fair, or poor?" This measure ranges from 1 (excellent) to 5 (poor).

Depressive symptoms—The HRS includes a short version of the Center for Epidemiological Studies Depression Scale, which has been validated on numerous populations (Wallace and Herzog 1995). The scale is designed to assess depressive symptoms. Each item on the scale is a question about how the respondent felt in the last week. For each item, respondents answered "all or almost all of the time," "most of the time," "some of the time," or "none or almost none of the time." These responses were coded 4 to 1, respectively; the depressive symptoms index is the average of the eleven items, with two positive affect statements reverse-coded. Higher values on this measure indicte greater levels of depression.

Covariates

Characteristics such as age, gender, race-ethnicity, and education are all causally prior to both marital biography and health at the ages examined here. We thus control for these variables in all models. The measures are straightforward. Age is measured in years within the 51 to 62 age range of the HRS. Dummy variables indicate male, black, and Hispanic race-ethnicity Education is measured in years. We also include a variable indicating whether the respondent had a disabling condition most of his or her adult life. We created it based on questions about whether the respondent has a disability, the condition that caused it, and the date of onset. People who reported a congenital condition, an injury acquired in childhood or adolescence, or a condition such as multiple sclerosis that began prior to adulthood were classified as having a long-term disability. We use it to allow in part for the effects of prior health on both marital biography and current health. Distributions of these covariates are shown in Table 1.

ANALYTIC STRATEGY

As we described in our conceptual framework, marital biography is composed of both marital transitions and durations in particular marital states. Sorting out the relative effects of marital transitions and marital states is of theoretical interest. However, although separating them conceptually is straightforward, separating them empirically is challenging. Transitions and durations are closely linked; the number, type, and timing of marital transitions in the life course determine time spent in particular marital states. Furthermore, having experienced no transitions is the same as being never married, and having experienced one transition is the same as being currently married for the first time. Finally, an individual's time unmarried, time married, and time disrupted sum to his or her age, and time in current state depends on age at transition. These same challenges face scholars analyzing any life history composed of transitions and states, such as those seeking to

disentangle the effects of childhood family structure on later outcomes (Wu and Martinson 1993).

These empirical realities, which are inherent to any study of marital biography and health, have three implications for the statistical modeling of the relationship between marital biography and health. First, the underlying cause in a model including only marital transition history is ambiguous. Persons with a history of marital loss may simply have spent less time married and more time disrupted than otherwise similar persons who have never experienced a marital loss. Second, including both transitions and durations in the same model is problematic, because those who have been married only once have values of zero for years disrupted and persons who have never married have values of zero for both years disrupted and years married. Thus in a model including measures of both duration and transition, variables indicating the continuously married and never married will capture any misspecifications in the effects of marital duration. Third, the identity linking age and years spent in each marital state means that variables measuring age and duration in each state cannot all be included in a model without introducing multi-collinearity. Even if one variable is left out of a model arbitrarily, the interpretation of the coefficients for the variables that are included is ambiguous due to their known link to the excluded variable. To avoid these distortions, we estimate a series of models for each health dimension that include marital transitions but not duration. Then we model the relationship between marital durations and health conditional on history of marital disruption. This modeling strategy follows our hypotheses.

Although the corresponding models for each health outcome include the same variables, the specification for each set varies according to the metric of the outcome variable. For number of chronic conditions and number of mobility limitations, both count variables, we used a negative binomial specification (Long 1997). Coefficients from negative binomial regression, when exponentiated, express the multiplicative change in the expected number of conditions or limitations associated with a one-unit change in an independent variable. For self-rated health, an ordinal variable, we used an ordered logistic specification. Ordered logistic regression estimates an underlying score as a linear function of independent variables and a set of cut-points. The probability of observing a particular value corresponds to the probability that the score is within the range of the cut-points estimated for that category. The coefficients in the tables represent the change in the score associated with a unit change in the independent variable. Although the coefficients are not directly interpretable in terms of the original scale, they can be used to judge direction, relative magnitude, and significance; they can also easily be translated into the more readily interpreted odds ratio by taking the inverse of the natural logarithm (i.e., exponentiation). Finally, we use ordinary least squares regression for the depression index measured at the interval level.

Because of the complex sampling design of the Health and Retirement Study, we re-estimated all our models using the sampling weights, which adjust for differential probabilities of selection into the sample. Since all substantive conclusions remained the same, we present the unweighted results. We also use the Huber-White variance estimator to allow for stratification and clustering and thus ensure that our test statistics are not inflated (Greene 1997).

RESULTS

Marital Transitions and Health

Table 2 presents model 1 for the number of chronic conditions (panel 1), number of mobility limitations (panel 2), self-rated health (panel 3), and depressive symptoms (panel 4) reported

by the respondent. This model includes current marital status, categorized as married, previously married, or never married, the measure most commonly found in the research literature. In fact, much of the literature simply distinguishes those currently married from those who are not married.

Table 2 shows that the previously married have significantly worse health than the currently married on all measures we examine. Specifically, previously married people experience, on average, 20 percent more conditions ($e^{.18} = 1.20$) and 23 percent more limitations ($e^{.21} = 1.23$). They rate their health less favorably and they show levels of depressive symptoms about one-fifth of a point higher on a four-point scale. All of these differences are statistically significant at the $p < .001$ level.

Never married respondents report significantly more mobility limitations, significantly worse self-rated health, and significantly more depressive symptoms, but they do not differ in number of chronic conditions from those who are currently married.

In model 2, shown in the left panel of Table 3, we divide those who are currently married into those who have been continuously married and those who have remarried after one or more marital disruptions; respondents who have been continuously married are the reference category. Remarried people and previously married people both show significantly worse health than the continuously married on all the dimensions of health we examine. Note that the coefficients for the previously married category are larger than the corresponding coefficients in Table 2, because the comparison group has become the continuously married. In Table 2, the comparison group was the currently married, many of whom were in second or later marriages. Coefficient tests showed that the remarried report significantly fewer chronic conditions, better self-rated health, and fewer depressive symptoms than previously married respondents ($p = .01$), but they do not differ in the number of mobility limitations they report ($p = .15$).

We found only one gender difference in the models presented above; for chronic conditions, the significant difference between remarried and previously married respondents was evident only for women. Interactive models showed that previously married women reported more chronic conditions than previously married men, while remarried men and women did not differ (results not shown).

Next, in model 3 we subdivide the remarried and previously married categories by the number and type of disruptions they experienced. These results are shown in the right panel of Table 3, and indicate quite clearly that among the currently married those who experienced one divorce or multiple disruptions show worse health on every dimension than the continuously married, but the widowed do not. However, all of those who were once married but are not married now show worse health on all dimensions than the continuously married. Death of a husband or wife seems to damage later health only if the bereaved fails to remarry. Interestingly, the health of those with multiple disruptions differs significantly in only a few scattered cases from the health of those with only one disruption.

Again, we found few gender differences in the relationships presented in model 3. Never married women rated their health no differently than continuously married women, while never married men rated their health significantly worse. Being previously married or never married was marginally worse for men's depression than for women's depression. Otherwise, the pattern of results was remarkably similar for both genders. These results provide strong support for our first hypothesis that marital transition history will be associated with health over and above current marital status, with marital loss inflicting costs on health years later, even among those who remarry.

Next, we test the hypothesis that health deficits among persons with a history of marital loss are largest for dimensions of health that reflect experiences over a long period, such as chronic conditions and mobility limitations, and smallest for dimensions of health such as depression that can change relatively quickly in response to marital transitions. We carry out this test by comparing coefficients for each marital transition history across the various health outcomes. We focus on the comparison between the continuously married and remarried in model 2, which provides the most stringent test of the hypothesis because people in both groups are currently married. Because we used different model specifications across the health outcomes, direct comparison of the coefficients is not possible. We developed two strategies to compare the coefficients across models.

First, we re-estimated all four models with the previously married as the omitted category so that continuously married and remarried respondents were compared to a common reference group. We then calculated the ratio between the coefficient for the remarried group (numerator) and the coefficient for the continuously married group (denominator); the closer this ratio is to one, the more similar the coefficients. We found that the ratio from the depression model was much closer to one (.84) than the ratios from the models for chronic conditions (.45), mobility limitations (.26), and self-rated health (.55).

Second, we re-estimated model 2 for self-rated health and depression with a negative binomial specification, treating them as if they were counts. We standardized the re-estimated d model 2 coefficients to allow for the different d ranges among the outcomes. We found that the a effect size for the relationship between remarriage and depression (.06) was about half as large as the effect size for chronic conditions (.10), mobility limitations (.13), and self-rated health (.12). Thus, the increase in depressive symptoms associated with being in the remarried group compared to the continuously married group was about half as large as the comparable increases in chronic conditions, mobility limitations, and poor self-rated health. To extend the second test for robustness, we also calculated effect size as the marginal change in health implied by the remarried coefficient for each outcome, and we tested whether these marginal effects differed across health outcomes. We found that the marginal effect implied by the depression coefficient was significantly smaller than the marginal effects implied by the coefficients for chronic conditions, mobility limitations, and self-rated health ($p = .01$). All these comparisons provide strong support for our second hypothesis; those dimensions of health that reflect underlying health—such as the development of chronic conditions, mobility limitations, or global assessments of health—are more strongly affected by a history of marital gain and loss than is depression, which is quite responsive to current marital status. Note that self-rated health seems to fit quite closely into the category of dimensions of health that reflect marital biography strongly. We return to this point later.

Marital Durations and Health

Next, we test the third hypothesis, which has two parts. First, among persons who have been continuously married, we hypothesize that those who have been married a greater proportion of their lives are in better health. Second, we test the parallel hypothesis that, among people who have been divorced at least once, those who have spent a greater proportion of their lives divorced are in worse health. Following the same logic as our second hypothesis, we expect these differentials to be largest for chronic conditions and mobility limitations and smallest for depression. One might also suspect that widowhood often differs from divorce in the costs it brings. We tested this idea by restricting the sample in model 2 of Table 4 to the divorced, excluding those who had been widowed. The results (not shown) are identical.

Table 4 presents models 1 and 2 for each measure of health. These models show the association between marital duration and health, conditional on previous marital transitions, with the continuously married in model 1 and the ever-disrupted in model 2.

When age is held constant, variation in years married among people who have married once and remained married is entirely due to differences in age at marriage, and vice versa. In the first three columns of Table 4, higher age at marriage is associated with fewer chronic conditions and fewer mobility limitations. No relationship between age at marriage and either self-rated health or depressive symptoms is apparent in model 1. This finding is the opposite of what one would expect if each year married protected health incrementally, but it could result from social class differences in age at marriage, especially in these cohorts, since social class is positively associated with both age at marriage and later health. We find that the positive relationship between age at marriage and better health later in life appears only for men, both for those who married once and remain married and for those who experienced at least one disruption. This gender difference strengthens our suspicion that social class differences in men's age at marriage underlie this relationship.

We next examine the relationship between marital durations and the health of persons who have experienced at least one marital loss (model 2). Like the models for the continuously married, these models include age and age at marriage. To represent individuals' marital transition histories, we include current marital status (currently remarried vs. not currently remarried) and an indicator variable for two or more disruptions. Those with one divorce are the omitted category. To represent marital durations, we include the percentage of years the respondent spent in the disrupted state since he or she first married. So, if a respondent married at age 22, divorced at age 42, and was interviewed at age 52, she has spent 33 percent (10 / 30) of the years since her first marriage in the disrupted state. If this person had remarried at age 47, she would have spent 17 percent of the years since her first marriage in a disrupted state (5 / 30); if she had divorced again at age 49 she would have spent 27 percent (8 / 30) of the years since her first marriage in a divorced state.

The second panel of Table 4 shows that, among those who ever experienced a marital disruption, higher age at marriage is related to fewer chronic conditions and mobility limitations, and better self-rated health. We find no relationship between age at marriage and depressive symptoms. Being currently married is significantly associated only with depressive symptoms in this group; in contrast, prior marital transitions are significantly associated with all outcomes except depression. These results agree quite closely with those from models 2 and 3 in Table 3. Finally, we see a positive association between the percentage of years that the respondent spent disrupted and the number of chronic conditions and mobility limitations that he or she reports. No such relationship appears for self-rated health and depressive symptoms. Note that these coefficients refer to the difference in conditions or limitations associated with a 1 percent change in the number of years disrupted, and recall that these coefficients, when exponentiated, show the multiplicative change in the number of conditions or limitations. On average, ever-disrupted respondents spent 28 percent of the time between first marriage and the interview in a disrupted status, and the standard deviation is large (SD = 24; see Table 1). A standard deviation increase in the percentage years disrupted would thus be associated with a 7 percent increase in number of chronic conditions and a 5 percent increase in number of mobility limitations.

Only two differences between men and women in these findings appear (results not shown). First, the negative association between age at marriage and chronic conditions was not apparent for women in either model, and the negative association between age at marriage and mobility limitations was not apparent for continuously married women. In contrast, the

relationship between percent of years disrupted and mobility limitations was apparent for women but not men.

DISCUSSION

In this article, we argued that the short-term effects of marital status and marital transitions on health extend to the long term and accumulate over the life course. We tested four specific hypotheses about the way this process unfolds by examining the association between marital biography and four dimensions of health in a nationally representative sample of mid-life adults. Overall, our results provide strong support for our expectations.

We first tested the hypothesis that health in mid-life is related to a person's history of marital transitions over and above his or her current marital status. We found that, on all the dimensions we examined, currently married persons who have never been divorced or widowed show better health than currently married persons who have ever experienced a marital loss. Previously married persons show poorer health than the continuously married on all dimensions, and poorer health than the remarried on all dimensions but mobility limitations. However, we found little evidence that people with multiple disruptions are in worse health than persons with a single disruption, given their current marital state.

Next, we tested the expectation that, conditional on marital transition history, duration in particular marital states is associated with health. In particular, we tested the parallel hypotheses that, among persons who had been continuously married, people who had been married a greater proportion of their lives would be healthier (hypothesis 2) and that, among people who had experienced at least one marital loss, people who had divorced or widowed a greater proportion of their lives would be in worse health (hypothesis 3). Our results partially support these hypotheses. Contrary to our second hypothesis, we found a negative relationship between age at marriage and chronic conditions and mobility limitations among men who have been continuously married, indicating that these conditions are positively related to duration of marriage. We speculate that differences in both men's age at marriage and health by social class underlie this finding. In support of our third hypothesis, among those with at least one marital disruption we found a positive relationship between the percent of years since first marriage spent divorced or widowed and both chronic conditions and mobility limitations, conditional on current marital status.

Fourth, we tested the hypothesis that health deficits among persons with a history of marital loss, shorter durations married, or longer durations unmarried would be largest for dimensions of health that reflect experiences over a long period, such as chronic conditions and mobility limitations, and smallest for dimensions of health such as depression that can change relatively quickly in response to marital transitions. Our results again support our expectations. In particular, the health advantage of the continuously married over the remarried appears to be largest for chronic conditions, mobility limitations, and self-rated health, and smallest for depressive symptoms. The percent of years since first marriage spent divorced or widowed was positively associated only with chronic conditions and mobility limitations, the two health conditions that develop slowly.

Our study adds to the growing body of work on the effects of marital biography on health. In particular, our results are suggestive regarding the components of marital biography that influence health over the long term. As we have noted, the relationship between marital biography and health may be due to experiences of marital transitions, experiences in marital states, or both. Furthermore, the relationship may reflect experiences of marriage or experiences of marital loss. *Being* married may protect or even improve health, *getting* divorced or becoming widowed may damage health, and *being* divorced or widowed may

damage health. Although our analyses do not provide a definitive resolution to this debate, they do offer some clues, most of which suggest that marital loss may be the dominant factor when considering conditions with long-term etiologies such as chronic conditions and mobility limitations. First, we found that marital loss was positively associated with chronic conditions and mobility limitations regardless of current marital status. Second, we found little support for the argument that health at mid-life is better for persons who have been married longer, at least among those who have been married continuously. If anything, the reverse is true for two health dimensions with long etiologies, where we might expect any relationship to be strongest. At the same time, we find strong and consistent effects of being married on later health; among those who have ever been divorced or widowed, the remarried generally show better health than those who have remained unmarried, and those who spent more time married report fewer chronic conditions and mobility limitations. Those who have never married have more mobility limitations, rate their health as worse, and show more depressive symptoms than the married. Those who have married once and remained married are consistently, strongly, and broadly advantaged.

Our results also point to substantial heterogeneity across health dimensions in the extent to which they reflect accumulated life experience. Some dimensions, such as depressive symptoms, seem to respond both quickly and strongly to changes in current conditions. In contrast, those health dimensions such as chronic conditions that develop slowly over a lengthy period show the imprint of past experiences. This suggests that thinking carefully about the etiology of dimensions of health can yield insight into the social processes that contribute to observed differentials. Similarly, considering both current state and prior marital history seems key to sorting out the impact of marriage on health.

In this article, we have emphasized the potential effects of marital biography on health. However, people with different levels of health may be more or less likely to marry, to experience divorce or widowhood, and to remarry. Poor health, especially poor mental health, can lead to marital dissatisfaction and divorce. Correlation in the health of spouses means that sick people are more likely to become widowed. Although health selection into marriage and health protection from marriage are often discussed as if they are competing explanations, they need not be so. Our reading of the existing evidence suggests that both types of relationships are present and that their magnitude varies by the health dimension under consideration. We see selection not as a threat to our story but as an integral part of the process by which health disparities are generated (Bulatao and Anderson 2004). Thinking in terms of marital biographies shifts attention to the way these processes interact over the life course to produce patterns of health advantage and disadvantage.

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TABLE 1

Measures of Marital History, Health and Covariates, 1992 Health and Retirement Study [a]

Measure	Mean (SD) or Percent
Marital History: Entire Sample (N = 8,809)	
Current Marital Status	
Married	74.7
Continuously Married	55.0
Remarried	19.7
Previously Married	21.5
Never Married	3.8
Previous Marital Transitions	
Continuously Married	55.0
Currently Remarried	
Divorced	13.9
Widowed	2.1
Two or More Disruptions	3.7
Previously Married	
Divorced	10.0
Widowed	5.3
Two or More Disruptions	6.2
Never Married	3.8
Marital History: Continuously Married (N = 4,841)[b]	
Marital Durations	
Age at Marriage	22.8 (5.1)
Years Married	33.2 (5.9)
Marital History: Ever Disrupted (N = 3,473)[b]	
Marital Durations [c]	
Age at Marriage	21.7 (5.0)
Years Married	24.8 (9.6)
Years Disrupted	9.5 (8.3)
Percent of Years Disrupted	28.3 (24.2)
Health and Covariates: Entire Sample	
Number of Chronic Conditions (0–6)	.80 (.92)
Number of Mobility Limitations (0–5) [d]	1.0 (1.4)
Self-rated health (1–5)	
Excellent	21.9
Very Good	28.2
Good	27.9
Fair	14.1
Poor	7.9
Depression Index [e] (1–4)	1.45 (.43)

Measure	Mean (SD) or Percent
Age	55.5 (3.2)
Male	45.1
Race-Ethnicity	
White	73.5
Black	17.3
Hispanic	9.2
Years of Education	12.1 (3.2)
Long-term Condition	2.5

[a]Sample includes white, black, and Hispanic age-eligible, non-proxy respondents not cohabiting at the time of the interview who provided complete information about marital transitions. Figures are unweighted.

[b]Respondents missing information about the beginning and end dates of any marriage are excluded.

[c]Years married includes years spent in all marriages. Years disrupted is the total number of years between first marriage and the interview that the respondent spent disrupted.

[d]3% of cases missing information.

[e]Higher values indicate more depressive symptoms.

TABLE 2

Coefficients from Regressions[a] of Health Measures on Current Marital Status, 1992 Health and Retirement Study

	Model 1			
	Number of Chronic Conditions	**Number of Mobility Limitations**	**Self-Rated Health**	**Depressive Symptoms**
Marital Status				
Currently Married	—	—	—	—
Previously Married	.18***	.21***	.42***	.18***
Never Married	.04	.12*	.31***	.13***
Age	.04***	.02***	.04***	−.004**
Male	.05*	−.36***	.02	−.06***
Black[b]	.22***	.15***	.67***	.05**
Hispanic[b]	−.15***	−.16**	.23*	.03
Years of Education	−.04***	−.09***	−.19***	−.03***
Long-term Condition	.32***	.74***	1.58***	.25***
Constant	−2.08***	.03		1.97***
Cut-point 1			−1.35	
Cut-point 2			.06	
Cut-point 3			1.51	
Cut-point 4			2.84	
N^c	8,809	8,512	8,809	8,809
Log Likelihood	−10,304	−11,561	−12,625	
χ^2	368	616	1,317	
F				114
(df)	(8)	(8)	(8)	(8,121)

*
$p \leq .05$;

**
$p \leq .01$;

***
$p \leq .001$

[a]Model specification varies by the metric of the outcome variable: chronic conditions (range 0–6) and mobility limitations (range 0–5) — negative binomial; self-rated health (range 1–5) —ordered logit; depression index (range 1–4) — OLS. Higher values indicate worse health.

[b]Reference category is non-Hispanic white.

[c]Standard errors calculated taking into account the clustered sampling design of the HRS.

TABLE 3

Coefficients from Regressions[a] of Health Outcomes on Current Marital Status and Previous Marital Transitions, 1992 Health and Retirement Study

	Model 2				Model 3			
	Number of Chronic Conditions	Number of Mobility Limitations	Self-rated Health	Depressive Symptoms	Number of Chronic Conditions	Number of Mobility Limitations	Self-rated Health	Depressive Symptoms
Marital Status & Transitions								
Currently Married								
Continuously Married	—	—	—	—				
Currently Remarried	.12***	.19***	.21***	.03**	—	—	—	—
One Divorce					.10**	.16***	.18**	.03*
Widowed					.04	.11	.19	.03
Multiple Disruptions					.23***	.36**	.34**	.05*
Previously Married	.22***	.27***	.48***	.19***				
One Divorce					.21***	.25***	.45***	.17***
Widowed					.15**	.18**	.40***	.21***
Multiple Disruptions					.26***	.35***	.57***	.20***
Never Married	.07	.18**	.36***	.14***	.07	.17**	.36***	.14***
Age	.04***	.02***	.04***	-.004**	.04***	.02***	.04***	-.004**
Male	.04	-.37***	.01	-.06***	.04	-.37***	.004	-.06***
Black[b]	.22***	.15***	.66***	.05**	.23***	.16***	.68***	.05**
Hispanic[b]	-.14**	-.14*	.24*	.03	-.14**	-.13*	.25*	.03
Years of Education	-.04***	-.09***	-.19***	-.03***	-.04***	-.09***	-.19***	-.03***
Long-term Condition	.32***	.74***	1.58***	.25***	.32***	.74***	1.58***	.26***
Constant	-2.15***	-.10		1.94***	-2.18***	-.14		1.95***
Cut-point 1			-1.21				-3.01	
Cut-point 2			.21				-1.68	
Cut-point 3			1.66				-.23	
Cut-point 4			2.98				1.18	

	Model 2				Model 3			
	Number of Chronic Conditions	Number of Mobility Limitations	Self-rated Health	Depressive Symptoms	Number of Chronic Conditions	Number of Mobility Limitations	Self-rated Health	Depressive Symptoms
N^c	8,809	8,512	8,809	8,809	8,809	8,512	8,809	8,809
Log Likelihood	−10,297	−11,548	−12,616		−10,294	−11,542	−12,615	
χ^2	423	655	1,326		425	702	1,342	
F				106				76
(df)	(9)	(9)	(9)	(9,121)	(13)	(13)	(13)	(13,121)

*
$p \leq .05$;

**
$p \leq .01$;

***
$p \leq .001$

[a] Model specification varies by the metric of the outcome variable: chronic conditions (range 0–6) and mobility limitations (range 0–5) — negative binomial; self-rated health (range 1–5) — ordered logit; depression index (Range 1–4) — OLS. Higher values indicate worse health.

[b] Reference category is non-Hispanic white.

[c] Standard errors calculated taking into account the clustered sampling design of the HRS.

TABLE 4

Coefficients from Regressions[a] of Health Outcomes on Marital Durations, By Marital Transition History, 1992 Health and Retirement Study

	Model 1 (Continuously Married)				Model 2 (Ever Disrupted)			
	Number of Chronic Conditions	Number of Mobility Limitations	Self-rated Health	Depression Index	Number of Chronic Conditions	Number of Mobility Limitations	Self-rated Health	Depression Index
Age at Marriage	-.01*	-.01*	-.01	.0001	-.01***	-.02***	-.01*	.003
Percent Years Disrupted					.003**	.002*	.002	-.0003
Currently Married					-.02	-.06	-.14	-.16***
Two or More Disruptions					.07	.10*	.07	.03
Age	.05***	.02***	.05***	-.002	.03***	.02**	.03**	-.007**
Male	.13***	-.40***	.07	-.07***	.008	-.25***	-.03	-.05**
Black[b]	.26***	.22**	.76***	.08***	.21***	.11*	.62***	.04*
Hispanic[b]	-.18**	-.07	.23	.03	-.06	-.17*	.30*	.03
Years of Education	-.03***	-.08***	-.18***	-.02***	-.04***	-.10***	-.21***	-.04***
Long-term Condition	.44***	.88***	1.75***	.27***	.22*	.62***	1.42***	.26***
Constant	-2.60***	-.16		1.73***	-1.26***	.58		2.40***
Cut-point 1			-.95				-2.34	
Cut-point 2			-.95				-.98	
Cut-point 3			2.10				.33	
Cut-point 4			3.52				1.60	
N[c]	4,841	4,702	4,841	4,841	3,473	3,346	3,473	3,473
Log Likelihood	-5,397	-5,956	-6,738		-4,267	-4,863	-5,099	
χ^2	218	372	574		206	408	669	
F				30				39
(df)	7	7	7	(7,120)	10	10	10	(10,121)

* $p \le .05$;

** $p \le .01$;

*** $p \le .001$

[a] Model specification varies by the metric of the outcome variable: chronic conditions (range 0–6) and mobility limitations (range 0–5) — negative binomial; self-rated health (range 1–5) — ordered logit; depression index (range 1–4) — OLS. Higher values indicate worse health.

[b] Reference category is non-Hispanic white.

[c] Standard errors calculated taking into account the clustered sampling design of the HRS.