Health Declines and Relationship Quality among Older Adults

Ye Luo, Ph.D.

Department of Sociology & Anthropology
Clemson University
Phone: (864)656-4209
Email: yel@clemson.edu

Linda Waite, Ph.D.
Department of Sociology and Center on Aging
University of Chicago

Abstract

This study examines the longitudinal relationship between declines in health and

relationship quality among older adults using data from 1320 respondents who were interviewed

in both waves of the National Social Life, Health and Aging Project (NSHAP). It finds that

baseline physical health has no effect on changes in relationship quality over a 5-year period, but

baseline mental health of both respondent's and his/her partner's is associated with changes in

relationship quality. Increases in respondent's depressive symptoms over a 5-year period are

associated with decreases in the levels of positive relationship quality and increases in the levels

of negative relationship quality.

Introduction

This study examines the longitudinal relationship between health and relationship quality among older adults using two waves of the National Social Life, Health and Aging Project (NSHAP). Although the protective effect of being married on physical and mental health is well-documented (Waite & Gallagher, 2000), recent research suggests that the degree of relationship quality, rather than simply the status of being married, may be more strongly associated with health and well-being. There is substantial evidence that higher quality marriages/intimate relationships are associated with better health and well-being (Robles, Slatcher, Trombello, & McGinn, 2013). Most of the studies, though, are based on cross-sectional data and they are limited in establishing causal directions between marital quality and health. Several recent studies using longitudinal survey data to examine the reciprocal relationship between marital quality and health found consistent effects of marital quality on subsequent changes in health outcomes, but the findings on the effect of health on subsequent changes in marital quality are mixed (Booth & Johnson, 1994; Miller, Hollist, Olsen, & Law, 2013; Proulx & Snyder-Rivas, 2013; Umberson & Williams, 2005; Umberson, Williams, Powers, Liu, & Needham, 2006; Wickrama, Lorenz, Rand, & Elder, 1997; Yorgason, Booth, & Johnson, 2008). In addition, most of the existing research focused on younger cohorts and we do not know whether the relationship between health and marital quality remains the same in old age. Furthermore, few studies included both physical and mental health and looked at the health status of both spouses. This study attempts to fill these gaps in the literature and addresses four research questions: (1) Does baseline health affect change in relationship quality over a 5-year period among older adults? (2) Does a decline in health lead to deterioration in relationship quality in old age? (3) Whose health, the respondent's or the partner's, has a stronger effect on

relationship quality? (4) Do physical health and mental health have similar effects on relationship quality?

Background

Although most theoretical work on the relationship between marital quality and health has focused on how marital quality predicts changes in health outcomes (e.g., life course theory, stress process theory, and socioemotional selectivity theory), it is also possible that health predicts changes in marital quality. Changes in spouses' health may set the stage for considerable shifts in power, leisure time and abilities, energy, and allocation of personal and financial resources in a marriage, potentially undermining its success (Booth & Johnson, 1994; Proulx & Snyder-Rivas, 2013).

In recent studies assessing changes in marital quality and health, health has been less frequently conceptualized as the independent variable than has marital quality (Proulx & Snyder-Rivas, 2013). Early work on this topic, often focused on specific disease entities like rheumatoid arthritis and cancer, demonstrated consistent cross-sectional relationships between illness and decreased marital satisfaction (e.g., Hawley, Wolfe, Cathey, & Roberts, 1991). In one of the first studies to assess if declines in health were associated with corresponding declines in marital quality, Booth and Johnson (1994) analyzed individuals over two waves spaced 3 years apart and found that respondents who experienced a decline in self-rated health also reported small but significant declines in marital happiness. There was no association found between declines in self-rated health and self-reported divorce proneness. Subsequent research has been mixed, with some studies verifying the findings in Booth and Johnson's work (e.g., (Northouse, Templin, Mood, & Oberst, 1998), others finding the opposite direction of effects, that is, declining health is related to increases in marital quality (e.g.,(Swensen & Fuller, 1992)), and still others finding

no association once the effect of the marital quality on health is taken into account (e.g., (Proulx & Snyder-Rivas, 2013; Umberson et al., 2006). Yorgason, Booth and Johnson (2008) painted a more complex picture of the health-marital quality relationship. They found that decreases in health are associated with declines in marital quality, but that the onset of disability was linked to enhanced marital quality. They also found that spouses' experienced declines in health were related to more extensive damage to marital quality. Moreover, health decrements were associated with greater changes in marital quality among the young and middle aged than among an older cohort.

Cohort differences in the effects of declining health on marital quality can be explained using life-course perspective and socioemotional selectivity theory (Yorgason et al., 2008). Looking from a life-course perspective, for older couples, declining health, especially physical health, are more likely to be anticipated and they are less likely to interfere with careers and child rearing as they would be for young and middle-aged couples. Socioemotional selectivity theory suggests that cohort differences in time perspectives influence the nature of changes in marital quality associated with declining health. When people perceive that time is running out, they limit their focus to present-oriented goals and people with whom they are emotionally close. Since older people are more likely to perceive that time is running out than younger people, older couples are more likely to choose to focus on each other when facing health declines. Both theories would suggest smaller declines in marital quality with declining health for older adults compared to younger adults.

Methods

Data

This study uses data from two waves of the National Social Life, Health and Aging Project (NSHAP), which surveyed a nationally representative probability sample of community-dwelling individuals aged 57–85 years selected from households across the United States screened in 2004 and a follow-up survey was conducted in 2010-2011. Among the 3,005 respondents interviewed in wave 1, 2,261 were re-interviewed, 430 died, 139 too ill to respond, 4 moved to nursing homes and 175 were lost to follow up. The analysis was restricted to 1,353 respondents who were married, cohabiting, or had a romantic sexual partner at the time of the first interview and who remained with the same sexual partner at the second interview. Further limited to the respondents who were not missing on the key variables, the analytical sample includes 1,320 respondents, 809 men and 511 women.

Relationship Quality

This study distinguishes the positive and negative dimensions of relationship quality as previous research on marital quality suggests that different dimensions of marital relationship have different antecedents and consequences (Bookwala & Franks, 2005; Fincham & Linfield, 1997; Glenn, 1990; Johnson et. al, 1986). The *positive dimension of relationship quality* is measured in each wave with four items (Kim & Waite, JGSS special issue): (i) The respondent was asked "Taking all things together, how would you describe your (marriage/relationship) with (PARTNER) on a scale from 1 to 7 with 1 being very unhappy and 7 being very happy?" (ii) In the social network roster, the respondent was asked how close he/she feels his/her relationship with the spouse/partner. The 4-point response scale ranges from "not very close" to "extremely close." The next two items are taken from a series of questions asking about support and demands from spouse/partner: (iii) "How often can you open up to (current partner) if you need to talk about your worries?" and (iv) "How often can you rely on (current partner) if you have a

problem?" The 3-point response options range from "never/hardly ever" to "often." With the first two scores rescaled to range from 1 to 3, the index of positive relationship quality is the average score of the four items. It ranges from 1 to 3 with higher values associated with higher levels of positive relationship; the Cronbach's alpha is .71 at Time 1 and .69 at Time 2.

The *negative dimension of relationship quality* is measured with two items from the series of questions on support/demands from spouse/partner with the 3-point response scale: (i) "How often does (current partner) make too many demands on you?" (ii) "How often does (current partner) criticize you?" The index of negative relationship quality is the average score of the two items, ranging from 1 to 3 with higher scores associated with higher levels of negative relationship quality; the Cronbach's alpha is .59 in both waves.

Physical and Mental Health

Four measures of respondent's health at each wave are included: self-rated physical health, functional vulnerability, chronic conditions, and depressive symptoms. *Self-rated physical health* is based on a question asking respondents to rate their physical health on a 5-point scale ranging from "poor" to "excellent." *Functional limitations* are created using reported difficulties in three domains: (i) activities of daily living (dressing, bathing, eating, getting in and out of bed, and toileting), (ii) mobility (working one block and walking across the room), and (iii) sensory function (vision and hearing; Laumann et al., 2008). The number of functional impairments is the sum of the items for which the respondent has difficulty (i.e., answering "some difficulty," "much difficulty," or "unable to do" to questions on activities of daily living and mobility items and answering "fair" or "poor" to questions on vision and hearing); it ranges from 0 to 9. *Number of chronic conditions* is the count of affirmative responses to a series of questions asking the respondent whether a doctor ever told him/her he/she has a specific

condition. In NSHAP, the question format for chronic conditions differs for wave 1 and wave 2; while wave 1 used "choose all that apply" format for most conditions, wave 2 asked respondents to answer "yes" or "no" to each condition. In part due to this format change, many cases have inconsistent answers in the two waves. Since research has shown that "yes" or "no" format tends to illicit more accurate responses (Rasinski, Mingey, & Bradburn, 1994), the cases with a chronic condition marked in wave 1, but received "no" answer to the same condition in wave 2 are treated as not having this condition in wave 1. Seven conditions which were asked in both waves are included: arthritis, asthma/lung disease, stroke, high blood pressure/hypertension, diabetes, heart disease, and cancer. *Depression* is measured using an eight-item short form of the Center for Epidemiological Studies Depression Scale (CES-D) asking how often the respondent felt last week on a 4-point scale ranging from "rarely/none of the time" to "most of the time" (e.g., "I felt that everything I did was an effort," "My sleep was restless"). With the two items that tap positive affect reverse coded, the scores on the eight items are averaged and higher values indicate more depressive symptoms. Cronbach's alpha is .78 in both waves. Health change scores are created by subtracting the values on wave 1 health measures from the values on corresponding wave 2 health measures.

In wave 1, the respondent was also asked to rate his/her *partner's physical and mental health* respectively on a 5-point scale ranging from "poor" to "excellent." In wave 2, partners were also interviewed and reported their own health. Because of this design change and that a large number of partners were not interviewed in wave 2, this study only includes respondent's report of his/own partner's physical and mental health at Time 1.

Control Variables

Socio-demographic variables which may affect both health and marital quality are included as control variables in the multivariate analyses, including age, gender, race/ethnicity, marital/sexual relationship, education, employment status, household income, and household wealth.

Statistical Procedures

All results are adjusted for the complex sampling design and sample weights, so that the findings can be generalized to the larger U.S. population. First, descriptive statistics are calculated for all respondents and then for men and women separately. Second, ordinary least squares regression is used to examine the relationship between health and relationship quality. Three models are estimated for each of the two relationship quality indexes measured at wave 2. The first model includes all health measures at wave 1 and sociodemographic controls to see whether Time 1 health status is associated with Time 2 relationship quality. The second model adds wave 1 relationship quality measures to see whether Time 1 health status is associated with changes in relationship quality between Time 1 and Time 2. The third model adds changes in health variables from wave 1 to wave 2 to see whether changes in health status from Time 1 to Time 2 is associated with changes in relationship quality from Time 1 to Time 2.

To test robustness of the findings, several sensitivity tests were conducted. These tests include (1) gender differences in the relationship between health and relationship quality, (2) the effect of relationship type, (3) sample selection bias, and (4) additional measures of physical and mental health.

Results

Descriptive Statistics

Descriptive statistics for all and separately for men and women are presented in Table 1. On a scale from 1 to 3, the average score on positive relationship quality is 2.79 and the average score on negative relationship quality is 1.51 at Time 1, indicating older adults are generally satisfied with their relationship with their partner. However, there are significant gender differences in perceived relationship quality: men scored higher on positive relationship quality than women (2.82 vs. 2.76) and men also scored higher on negative relationship quality than women (1.56 vs. 1.43). Scores on both positive and negative relationship quality declined slightly but significantly between Time 1 and Time 2, and gender differences remain statistically significant with men scoring higher than women on both relationship quality indicators at Time 2.

"Table 1 about here"

At Time 1, the average score is 3.49 on self-rated physical health, .86 on physical vulnerability, 1.10 on chronic conditions and 1.47 on depressive symptoms. From Time 1 to Time 2, respondents' physical health has declines as indicated by significant declines in self-rated physical health and significant increases in physical vulnerability and chronic conditions. However, the change in depressive symptoms between Time 1 and Time 2 is not statistically significant. Men and women are not significantly different in self-rated physical health and physical vulnerability, but men reported more chronic conditions at Time 2 than women (1.67 vs. 1.48). Women reported higher levels of depressive symptoms than men at both Time 1 and Time 2.

The proportion of women is 42%; this is because women are more likely to be divorced and widowed than men and those who are divorced and widowed at either Time 1 or Time 2 were excluded from the analytic sample. A higher proportion of women than men are in their

first marriage (68% vs. 61%). In addition, men are higher on levels of education, household income, and household assets and they are more likely to be working than women (49% vs. 34%).

Effects of Health on Relationship Quality

Results from OLS regressions of relationship quality measures at Time 2 on relationship quality and health at Time 1 and changes in health between Time 1 and Time 2 for all respondents are presented in Table 2. Demographics are controlled for in all these models. In Model 1 when Time 1 relationship quality is not controlled for, partner's self-rated mental health is positively associated with positive relationship quality at Time 2 (b=.08) and respondents' own levels of depressive symptoms are negatively associated with positive relationship quality at Time 2 (b=-.11). In Model 2 which adds Time 1 relationship quality and thus the coefficients indicated the effect of Time health on changes in positive relationship quality, the coefficient of partner's self-rated mental health is cut in half (b=.03), but remains significant, and the coefficient of respondent's depressive symptoms is also substantially attenuated (b=-.03) and becomes marginally significant. In Model 3 which adds measures of change in respondents' physical and emotional health, the coefficient of changes in depressive symptoms is significant (b=-.12); an increase in depressive symptoms between Time 1 and Time 2 is associated with a decrease in levels of positive relationship quality. However, the coefficients of the physical health measures for respondents and their partners are not statistically significant in any of the three models.

"Table 2 about here"

Similar effects are found for negative relationship quality measure. In Model 1 when Time 1 relationship quality is not controlled for, partner's higher levels of self-rated mental

health are associated with lower levels of negative relationship quality at Time 2 (b=-.09) and respondents' own higher levels of depressive symptoms are associated with higher levels of negative relationship quality at Time 2 (b=-.16). In Model 2 which adds Time 1 relationship quality, the coefficient of partner's self-rated mental health is cut in half (b=-.04), but remains significant, and the coefficient of respondent's depressive symptoms is also substantially attenuated (b=.07) and becomes marginally significant. In Model 3 which adds measures of change in respondents' physical and emotional health, the coefficient of changes in depressive symptoms is significant (b=.19); an increase in depressive symptoms between Time 1 and Time 2 is associated with an increase in levels of negative relationship quality. The coefficients of the physical health measures for respondents and their partners are not statistically significant in any of the three models.

Results on demographic variables show that women have lower levels of both positive and negative relationship quality than men even after controlling for other demographics and health variables. All minority race/ethnic groups have lower levels of positive relationship quality than whites and blacks and Hispanics also have higher levels of negative relationship quality than whites. Cohabiters have lower levels of positively relationship quality than those in their first marriage.

Sensitivity Tests

Gender differences. In order to see whether the relationship between health and relationship quality differ between men and women, OLS regression models were run separately for men and women and interaction terms were used to test the significance of gender differences. The results are presented in Table 3 and Table 4. Some notable gender differences are: (1) Partner's mental health and respondent's own depressive symptoms at Time 1 are

significantly associated with changes in negative relationship quality from Time 1 to Time 2 for

men, but they are not significant for women; (2) For men only, changes in respondent's physical

vulnerability from Time 1 to Time 2 are marginally associated with changes in negative

relationship quality, but the association is negative; (3) For men only, changes in respondent's

chronic conditions from Time 1 to Time 2 are associated with changes in positive relationship

quality, but the association is positive; (4) For women only, chronic conditions at Time 1 were

associated with changes in positive relationship quality from Time 1 to Time 2, but the

association is positive. Of these differences, only the effect of chronic conditions at Time 1 on

positive relationship quality from Time 1 to Time 2 is statistically significant.

<div align="center">"Table 3 and Table 4 about here"</div>

Sample attrition. Since out of the 2013 respondents who were with a partner at Time 1,

660 (33%) are no longer with the same partner, the results could be biased if those who were

excluded are different from those who were included. Additional analysis showed that those

who were excluded had lower positive relationship quality, more chronic conditions and poorer

partner's physical health, and they were older and more likely to be with a sexual partner rather

than being married or cohabiting. To adjust for potential selection bias, the probability of

staying in the sample was estimated from demographic variables, Time 1 health and relationship

quality measures using logistic regression, and the OLS regressions of relationship quality in

Table 2 were rerun with the probability of staying included as a control variable. The results

were similar to those in Table 2.

[Stata has a Heckman procedure to adjust for attrition bias. However, svy: Heckman

procedure only worked for regressions on positive relationship quality. The regressions on

negative relationship quality failed to converge.]

Relationship types. To see whether relationship types have any effect on the relationship between health and relationship quality, the OLS regression models were rerun with only married respondents. The results were essentially unchanged.

Other health measures. Other physical and mental health measures were also experimented, including ADLs, respondent's self-rated mental health, and a measure of respondent's psychological distress which combined the scores on depressive symptoms, anxiety and stress. This analysis shows similar patterns, that is, ADLs and changes in ADLs are not significantly associated with changes in relationship quality, but self-rated mental health and psychological distress and the changes in them are significantly associated with relationship quality.

Discussion (to be expanded)

This study examined the longitudinal relationship between health and relationship quality among older adults. The results show that baseline physical health, as measured by self-rated health, physical impairments and chronic conditions, has no effect on changes in relationship quality over a 5-year period, but baseline mental health of both respondent's and his/her partner's is associated with changes in relationship quality over a 5-year period: respondents reported higher levels of positive relationship quality and lower levels of negative relationship quality when they have lower depressive symptoms and when their spouse/partner has good mental health. In addition, increases in respondent's depressive symptoms over a 5-year period are associated with decreases in the levels of positive relationship quality and increases in the levels of negative relationship quality in the same period. While previous research focused on physical health and its effect on marital quality often showed no association of health with

subsequent changes in marital quality, the findings from this study underscore the importance of bringing in mental health back into this area of inquiry.

This study has several limitations. First, although we included partner's physical and mental health at Time 1 in the analysis, changes of partner's health from Time 1 to Time 2 are not included for two reasons. The first reason is that partner's health was reported by the respondent in wave 1, but it was reported by the partner himself/herself in wave 2. The partners could have used different criteria when assessing health and the compatibility of wave 1 and wave 2 is questionable. The second reason is that a large number of the partners (374 out of 1,320, or 28%) were not interviewed at wave 2. Second, relationship quality scales were based on fewer items than the scales used in some other studies, especially the measure of negative dimension of relationship quality, which may have contributed to the relatively lower reliability scores. Third, detailed analyses of the effects of relationship types are not possible due to the small number of respondents in cohabiting and sexual partner categories. Fourth, selective attrition could still bias the results although additional analyses adjusting for selection bias showed similar results. Five, the two waves of NSHAP are five years apart and this is relative short for observing severe health changes and the consequence of declining health on relationship quality.

The findings that physical health does not have much effect on changes in relationship quality in older adults are consistent with the predictions from life course stage theory and socioemotional selectivity theory. They are also consistent with previous longitudinal studies, some of which showed that the effect of physical health becomes non-significant once the reverse effect of relationship on health is taken into account while others showed the negative

14

effects of declining health on relationship quality is weaker for older adults than for younger

adults.

References

Booth, A., & Johnson, D. R. (1994). Declining health and marital quality. *Journal of Marriage and the Family, 56*(1), 218-223.

Miller, R. B., Hollist, C. S., Olsen, J., & Law, D. (2013). Marital Quality and Health Over 20 Years: A Growth Curve Analysis. *Journal of Marriage and Family, 75*(3), 667-680.

Northouse, L. L., Templin, T., Mood, D., & Oberst, M. (1998). Couples' adjustment to breast cancer and benign breast disease: a longitudinal analysis. *Psycho-Oncology, 7*(1), 37-48.

Proulx, C. M., & Snyder-Rivas, L. A. (2013). The longitudinal associations between marital happiness, problems, and self-rated health. *Journal of Family Psychology, 27*(2), 194-202.

Rasinski, K. A., Mingey, D., & Bradburn, N. M. (1994). Do respondents really "mark all that apply" on self-administered questions? *Public Opinion Quarterly, 58*(3), 400-408.

Robles, T. F., Slatcher, R. B., Trombello, J. M., & McGinn, M. M. (2013). Marital Quality and Health: A Meta-Analytic Review. *Psychological Bulletin*, No Pagination Specified.

Swensen, C. H., & Fuller, S. R. (1992). Expression of Love, Marriage Problems, Commitment, and Anticipatory Grief in the Marriages of Cancer Patients. *Journal of Marriage and the Family, 54*(1), 191-196.

Umberson, D., & Williams, K. (2005). Marital Quality, Health, and Aging: Gender Equity? *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 60*(Special Issue 2), S109-S113.

Umberson, D., Williams, K., Powers, D. A., Liu, H., & Needham, B. (2006). You Make Me Sick: Marital Quality and Health Over the Life Course. *Journal of Health and Social Behavior, 47*(1), 1-16.

Waite, L. J., & Gallagher, M. (2000). *Case for Marriage : Why Married People Are Happier, Healthier and Better off Financially*. Westminster, MD: Broadway Books. .

Wickrama, K. A. S., Lorenz, F. O., Rand, D. C., & Elder, G. H., Jr. (1997). Marital Quality and Physical Illness: A Latent Growth Curve Analysis. *Journal of Marriage and Family, 59*(1), 143-155.

Yorgason, J. B., Booth, A., & Johnson, D. (2008). Health, Disability, and Marital Quality: Is the Association Different for Younger Versus Older Cohorts? *Research on Aging, 30*(6), 623-648.

Table 1. Descriptive statistics

	All		Men		Women		p of gender
	Mean/%	SE	Mean/%	SE	Mean/%	SE	difference
Age	65.767	(0.249)	65.979	(0.377)	65.472	(0.270)	
Female	41.6						
Race/ethnicity							
White	84.0		83.4		84.8		
Black	6.9		6.7		7.1		
Hispanic	7.2		7.6		6.5		
Other race	2.0		2.2		1.6		
Marital status							**
First marriage	63.7		60.7		68.0		
Not first marriage	30.7		34.3		25.5		
Cohabiting	2.7		1.7		4.1		
Sexual partner	2.9		3.2		2.4		
Education							**
Less than high school	12.2		13.5		10.5		
High school	24.0		22.5		26.0		
Some college	32.6		28.4		38.5		
College graduate	31.2		35.6		24.9		
Current working	42.8		49.0		34.1		**
Household income							**
<25000	13.3		13.6		12.8		
25000-50000	27.4		27.9		26.8		
>=500000	52.0		54.6		48.5		
Income missing	7.2		3.9		12.0		
Household assets							**
<50000	10.4		10.7		10.0		
50000-500000	40.6		42.2		38.4		
>=500000	36.8		38.5		34.4		
Assets missing	12.2		8.6		17.2		
Partner self-rated physical health	3.424	(0.042)	3.452	(0.051)	3.384	(0.063)	
Partner self-rated mental health	3.802	(0.041)	3.824	(0.044)	3.771	(0.060)	
Self-rated physical health at Time 1	3.490	(0.039)	3.477	(0.049)	3.508	(0.055)	
Self-rated physical health at Time 2	3.323	(0.047)	3.286	(0.051)	3.376	(0.064)	
Physical vulnerability at Time 1	0.859	(0.057)	0.902	(0.075)	0.800	(0.069)	
Physical vulnerability at Time 2	1.110	(0.059)	1.143	(0.067)	1.065	(0.079)	
Chronic conditions at Time 1	1.098	(0.032)	1.138	(0.040)	1.042	(0.050)	
Chronic conditions at Time 2	1.590	(0.038)	1.671	(0.034)	1.477	(0.068)	**
Depressive symptoms at Time 1	1.474	(0.016)	1.433	(0.020)	1.531	(0.026)	**
Depressive symptoms at Time 2	1.465	(0.019)	1.440	(0.023)	1.501	(0.025)	*
Positive relationship quality at Time 1	2.791	(0.012)	2.817	(0.013)	2.755	(0.018)	**
Positive relationship quality at Time 2	2.768	(0.011)	2.797	(0.011)	2.727	(0.017)	**
Negative relationship quality at Time 1	1.507	(0.018)	1.562	(0.021)	1.429	(0.030)	**
Negative relationship quality at Time 2	1.456	(0.017)	1.507	(0.023)	1.385	(0.027)	**

Note. N=1320. Results are weighted and adjusted for sampling design.
+ significant at 10%; * significant at 5%; ** significant at 1%
Numbers in red indicate significant change from Time 1 to Time 2 at 10%

Table 2. OLS regression coefficients of relationship quality at Time 2 on relationship quality and health at Time 1 and health changes between Time 1 and Time 2 (All respondents)

	Positive relationship quality			Negative relationship quality		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Age	-0.003+	-0.001	-0.001	-0.000	-0.001	-0.001
	(1.763)	(0.873)	(0.907)	(0.121)	(0.560)	(0.497)
Female	-0.055**	-0.033*	-0.030+	-0.145**	-0.069*	-0.075*
	(3.103)	(2.084)	(1.878)	(4.496)	(2.112)	(2.293)
Race/ethnicity (ref=White)						
Black	-0.091*	-0.075*	-0.072*	0.184**	0.111+	0.109+
	(2.272)	(2.193)	(2.021)	(2.884)	(1.993)	(1.913)
Hispanic	-0.085*	-0.075*	-0.078**	0.157*	0.123+	0.128*
	(2.132)	(2.411)	(2.699)	(2.496)	(1.958)	(2.016)
Other race	-0.131**	-0.142**	-0.137**	0.145	0.080	0.074
	(3.069)	(3.279)	(3.103)	(1.074)	(0.686)	(0.672)
Marital status (ref=First marriage)						
Not first marriage	-0.003	-0.002	-0.001	-0.008	0.019	0.016
	(0.124)	(0.128)	(0.080)	(0.216)	(0.609)	(0.500)
Cohabiting	-0.134+	-0.130*	-0.149*	-0.022	-0.005	0.021
	(2.008)	(2.120)	(2.528)	(0.225)	(0.055)	(0.225)
Sexual partner	-0.100*	-0.047	-0.047	-0.123	0.020	0.012
	(2.179)	(1.223)	(1.370)	(1.241)	(0.228)	(0.145)
Education (ref=less than high school)						
High school	-0.026	-0.018	-0.025	0.065	0.001	0.011
	(0.562)	(0.507)	(0.699)	(0.869)	(0.018)	(0.175)
Some college	0.002	0.017	0.008	0.037	-0.039	-0.025
	(0.050)	(0.433)	(0.216)	(0.573)	(0.657)	(0.422)
College graduate	0.007	0.003	-0.008	0.068	-0.007	0.009
	(0.137)	(0.065)	(0.205)	(0.952)	(0.115)	(0.133)
Current working	-0.001	0.013	0.012	0.031	0.000	0.004
	(0.036)	(0.631)	(0.573)	(0.995)	(0.011)	(0.126)
Household income (ref=less than 25000)						
25000-50000	0.023	0.011	0.011	-0.008	-0.032	-0.030
	(0.746)	(0.418)	(0.419)	(0.160)	(0.570)	(0.547)
>=500000	0.029	0.015	0.010	-0.133*	-0.094	-0.086
	(0.918)	(0.491)	(0.340)	(2.012)	(1.445)	(1.360)
Income missing	0.062	0.047	0.048	0.017	-0.038	-0.036
	(0.909)	(0.757)	(0.814)	(0.177)	(0.418)	(0.398)
Household assets (ref=less than 50000)						
50000-500000	0.069+	0.054	0.051	0.118+	0.084	0.089
	(1.704)	(1.539)	(1.444)	(1.800)	(1.365)	(1.454)
>=500000	0.044	0.046	0.045	0.203**	0.137*	0.139*
	(1.001)	(1.122)	(1.118)	(2.753)	(2.215)	(2.268)
Assets missing	0.032	0.025	0.027	0.155+	0.136	0.130
	(0.580)	(0.477)	(0.554)	(1.715)	(1.658)	(1.638)
Partner self-rated physical health	0.002	0.000	-0.003	-0.003	0.003	0.009
	(0.185)	(0.040)	(0.331)	(0.112)	(0.167)	(0.467)
Partner self-rated mental health	0.078**	0.030**	0.032**	-0.094**	-0.040*	-0.042*
	(6.282)	(2.771)	(2.978)	(4.817)	(2.126)	(2.308)

	(1)	(2)	(3)	(4)	(5)	(6)
Self-rated physical health	-0.003	0.002	0.004	0.004	-0.008	-0.013
	(0.307)	(0.200)	(0.337)	(0.190)	(0.548)	(0.650)
Physical vulnerability	0.009	0.007	0.009	-0.012	-0.012	-0.018
	(1.160)	(1.055)	(1.198)	(1.112)	(1.082)	(1.666)
Chronic conditions	0.007	-0.001	0.004	0.027	0.025	0.019
	(0.540)	(0.074)	(0.443)	(1.599)	(1.597)	(1.198)
Depressive symptoms	-0.107**	-0.033+	-0.099**	0.157**	0.068+	0.175**
	(4.719)	(1.880)	(4.285)	(4.331)	(1.818)	(3.989)
Positive relationship quality at Time 1		0.512**	0.501**			
		(11.937)	(11.882)			
Negative relationship quality at Time 1					0.447**	0.438**
					(15.922)	(15.903)
Self-rated physical health change			0.002			-0.003
			(0.144)			(0.169)
Physical vulnerability change			0.004			-0.013
			(0.504)			(1.387)
Chronic conditions change			0.015			-0.015
			(1.473)			(0.791)
Depressive symptoms change			-0.116**			0.189**
			(3.943)			(5.615)
Constant	2.776**	1.311**	1.439**	1.487**	0.904**	0.757**
	(20.493)	(8.745)	(9.219)	(6.535)	(4.923)	(3.641)
R-squared	0.151	0.329	0.349	0.106	0.279	0.297

Note: N=1320. Results are weighted and adjusted for complex sample design. t statistics in parentheses
+ significant at 10%; * significant at 5%; ** significant at 1%

Table 3. OLS regression coefficients of relationship quality at Time 2 on relationship quality and health at Time 1 and health changes between Time 1 and Time 2 (Men)

	Positive relationship quality			Negative relationship quality		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Age	-0.003*	-0.002	-0.003	0.002	-0.000	0.000
	(2.300)	(1.634)	(1.630)	(0.574)	(0.058)	(0.050)
Race/ethnicity (ref=White)						
Black	-0.082*	-0.055+	-0.052	0.246**	0.117+	0.117+
	(2.274)	(1.692)	(1.564)	(3.762)	(1.679)	(1.680)
Hispanic	-0.069	-0.070	-0.073+	0.166+	0.122	0.117
	(1.364)	(1.527)	(1.697)	(1.800)	(1.335)	(1.239)
Other race	-0.141+	-0.131+	-0.117	0.243	0.111	0.090
	(1.868)	(1.803)	(1.641)	(1.444)	(0.733)	(0.635)
Marital status (ref=First marriage)						
Not first marriage	-0.017	-0.022	-0.025	0.046	0.047	0.051
	(0.686)	(0.937)	(1.107)	(0.943)	(1.031)	(1.094)
Cohabiting	-0.239+	-0.225+	-0.228+	0.056	0.179	0.177
	(1.862)	(1.812)	(1.825)	(0.375)	(1.103)	(1.145)
Sexual partner	-0.033	0.002	-0.008	-0.169	-0.044	-0.032
	(0.818)	(0.068)	(0.242)	(1.583)	(0.441)	(0.302)
Education (ref=less than high school)						
High school	-0.038	-0.006	-0.017	-0.011	-0.073	-0.062
	(0.691)	(0.115)	(0.344)	(0.108)	(0.912)	(0.778)
Some college	-0.019	0.003	-0.016	-0.053	-0.109	-0.083
	(0.366)	(0.068)	(0.347)	(0.620)	(1.470)	(1.119)
College graduate	-0.018	-0.006	-0.023	0.004	-0.057	-0.036
	(0.343)	(0.126)	(0.512)	(0.043)	(0.738)	(0.457)
Current working	0.022	0.027	0.026	0.026	-0.010	-0.005
	(0.878)	(1.279)	(1.274)	(0.501)	(0.197)	(0.112)
Household income (ref=<25000)						
25000-50000	0.033	0.009	0.010	0.026	-0.003	-0.001
	(0.804)	(0.259)	(0.273)	(0.304)	(0.036)	(0.014)
>=500000	-0.001	-0.011	-0.014	-0.045	-0.032	-0.024
	(0.037)	(0.305)	(0.390)	(0.536)	(0.367)	(0.291)
Income missing	0.216**	0.193*	0.184**	-0.019	0.005	0.031
	(2.717)	(2.564)	(2.837)	(0.133)	(0.036)	(0.199)
Household assets (ref=<50000)						
50000-500000	0.071	0.064	0.062	0.120	0.080	0.081
	(1.549)	(1.589)	(1.646)	(1.221)	(0.886)	(0.950)
>=500000	0.077	0.081+	0.082*	0.183+	0.116	0.112
	(1.529)	(1.805)	(2.040)	(1.720)	(1.246)	(1.251)
Assets missing	-0.059	-0.091	-0.079	0.129	0.087	0.065
	(0.596)	(0.975)	(1.009)	(0.935)	(0.652)	(0.512)
Partner self-rated physical health	0.003	-0.000	-0.003	0.026	0.027	0.031
	(0.268)	(0.001)	(0.227)	(0.788)	(0.968)	(1.178)
Partner self-rated mental health	0.062**	0.032**	0.034**	-0.094**	-0.050*	-0.051*
	(4.902)	(2.755)	(3.099)	(3.292)	(2.013)	(2.126)
Self-rated physical health	-0.003	-0.004	0.006	-0.024	-0.024	-0.041
	(0.266)	(0.418)	(0.520)	(0.990)	(1.273)	(1.515)

	(1)	(2)	(3)	(4)	(5)	(6)
Physical vulnerability	0.011	0.011	0.012	-0.016	-0.024	-0.032+
	(1.470)	(1.545)	(1.298)	(1.009)	(1.675)	(1.994)
Chronic conditions	-0.008	-0.010	-0.002	0.020	0.018	0.010
	(0.615)	(0.757)	(0.220)	(0.944)	(1.050)	(0.532)
Depressive symptoms	-0.094*	-0.029	-0.089*	0.175**	0.106+	0.212**
	(2.619)	(0.880)	(2.490)	(3.135)	(1.948)	(3.430)
Positive relationship quality at Time 1		0.446**	0.431**			
		(7.893)	(7.835)			
Negative relationship quality at Time 1					0.409**	0.402**
					(9.490)	(9.385)
Self-rated physical health change			0.010			-0.009
			(0.763)			(0.323)
Physical vulnerability change			0.004			-0.026+
			(0.420)			(1.947)
Chronic conditions change			0.024*			-0.038
			(2.016)			(1.341)
Depressive symptoms change			-0.121**			0.204**
			(2.902)			(4.433)
Constant	2.882**	1.593**	1.695**	1.310**	0.876**	0.778**
	(21.335)	(7.776)	(8.595)	(4.102)	(3.356)	(2.735)
R-squared	0.137	0.273	0.301	0.090	0.236	0.258

Note: N=809. Results are weighted and adjusted for complex sample design. t statistics in parentheses
+ significant at 10%; * significant at 5%; ** significant at 1%

Table 4. OLS regression coefficients of relationship quality at Time 2 on relationship quality and health at Time 1 and health changes between Time 1 and Time 2 (Women)

	Positive relationship quality			Negative relationship quality		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Age	-0.000	0.001	0.001	-0.006	-0.004	-0.004
	(0.064)	(0.465)	(0.410)	(1.521)	(1.142)	(1.264)
Race/ethnicity (ref=White)						
Black	-0.136+	-0.125+	-0.125+	0.126	0.115	0.121
	(1.849)	(1.956)	(1.908)	(1.382)	(1.451)	(1.521)
Hispanic	-0.135**	-0.090*	-0.099*	0.149+	0.120	0.136+
	(2.904)	(2.020)	(2.124)	(1.866)	(1.501)	(1.852)
Other race	-0.115	-0.174	-0.181+	-0.020	0.058	0.074
	(1.057)	(1.637)	(1.702)	(0.174)	(0.468)	(0.581)
Marital status (ref=First marriage)						
Not first marriage	0.022	0.027	0.034	-0.118*	-0.030	-0.045
	(0.630)	(0.915)	(1.138)	(2.191)	(0.726)	(1.090)
Cohabiting	-0.068	-0.067	-0.082	-0.068	-0.116	-0.102
	(0.969)	(1.311)	(1.653)	(0.520)	(1.026)	(0.954)
Sexual partner	-0.258*	-0.165+	-0.149+	-0.081	0.123	0.094
	(2.659)	(1.711)	(1.709)	(0.426)	(0.755)	(0.654)
Education (ref=less than high school)						
High school	0.011	-0.026	-0.031	0.188*	0.099	0.106
	(0.209)	(0.603)	(0.723)	(2.124)	(1.171)	(1.247)
Some college	0.055	0.049	0.049	0.198*	0.053	0.051
	(1.018)	(1.126)	(1.166)	(2.579)	(0.714)	(0.702)
College graduate	0.068	0.028	0.023	0.168+	0.046	0.054
	(1.112)	(0.580)	(0.493)	(1.982)	(0.547)	(0.640)
Current working	-0.033	-0.009	-0.009	0.021	0.005	0.001
	(0.922)	(0.271)	(0.253)	(0.440)	(0.094)	(0.014)
Household income (ref=<25000)						
25000-50000	0.016	0.021	0.019	-0.075	-0.064	-0.060
	(0.422)	(0.685)	(0.596)	(1.094)	(1.138)	(1.099)
>=500000	0.104*	0.070+	0.063+	-0.309**	-0.179**	-0.166*
	(2.254)	(1.935)	(1.765)	(3.765)	(2.953)	(2.660)
Income missing	-0.008	-0.016	-0.008	-0.068	-0.134	-0.147
	(0.097)	(0.210)	(0.116)	(0.602)	(1.344)	(1.568)
Household assets (ref=<50000)						
50000-500000	0.060	0.036	0.026	0.135	0.087	0.097
	(1.037)	(0.740)	(0.499)	(1.642)	(1.195)	(1.332)
>=500000	-0.048	-0.032	-0.039	0.298**	0.186*	0.193*
	(0.709)	(0.561)	(0.663)	(3.392)	(2.278)	(2.352)
Assets missing	0.085	0.100	0.093	0.231*	0.206*	0.216*
	(1.178)	(1.519)	(1.418)	(2.301)	(2.033)	(2.268)
Partner self-rated physical health	-0.011	-0.005	-0.010	-0.037	-0.026	-0.019
	(0.637)	(0.333)	(0.684)	(1.506)	(1.350)	(1.036)
Partner self-rated mental health	0.115**	0.042*	0.044*	-0.098**	-0.020	-0.023
	(5.341)	(2.145)	(2.275)	(3.858)	(0.749)	(0.836)
Self-rated physical health	0.000	0.012	0.009	0.032	0.003	0.012
	(0.022)	(0.726)	(0.444)	(0.973)	(0.109)	(0.426)

	(1)	(2)	(3)	(4)	(5)	(6)
Physical vulnerability	0.009	0.004	0.008	-0.016	0.002	0.001
	(0.580)	(0.317)	(0.701)	(1.206)	(0.167)	(0.073)
Chronic conditions	0.042**	0.022+	0.025*	0.035	0.032	0.027
	(2.952)	(1.873)	(2.412)	(1.284)	(1.276)	(1.161)
Depressive symptoms	-0.121**	-0.033	-0.101*	0.147*	0.025	0.127*
	(3.316)	(1.238)	(2.677)	(2.571)	(0.623)	(2.124)
Positive relationship quality at Time 1		0.565**	0.554**			
		(10.020)	(9.952)			
Negative relationship quality at Time 1					0.508**	0.499**
					(10.397)	(10.672)
Self-rated physical health change			-0.001			0.006
			(0.039)			(0.242)
Physical vulnerability change			0.005			0.003
			(0.481)			(0.204)
Chronic conditions change			0.002			0.016
			(0.098)			(0.614)
Depressive symptoms change			-0.107**			0.162**
			(2.797)			(2.765)
Constant	2.395**	0.870**	1.029**	1.715**	0.897**	0.725*
	(8.942)	(3.392)	(3.824)	(4.420)	(2.787)	(2.036)
R-squared	0.218	0.421	0.433	0.157	0.361	0.376

Note: N=511. Results are weighted and adjusted for complex sample design. t statistics in parentheses
+ significant at 10%; * significant at 5%; ** significant at 1%